SELECTIONS

FROM THE

RECORDS OF GOVERNMENT,

NORTH-WESTERN PROVINCES.

Vol. V.

Allahabad:

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SELECTIONS

FROM THE

RECORDS OF GOVERNMENT,

NORTH-WESTERN PROVINCES.

ROADS.

No. 1.

CONSTRUCTION OF PUBLIC ROADS.

Circular Order by Military Board, Fort William.

No. 2115.

To The SUPERINTENDING ENGINEER,
North-Western Provinces.

Sir,

It being considered desirable, with the view of securing uniformity in the construction of roads, that some standard rules should be observed, I am directed by the Military Board to transmit the enclosed Circular letter on the subject, accompanied by a sheet of Sections.

I have, &c.,
G. YOUNG,
Secy., Mily. Board.

Fort William,
Military Board's Office:
6th September, 1833.

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RULES FOR CONSTRUCTION OF ROADS.

It having been observed that various opinions exist on the formation of roads, which might lead to much diversity in the mode of their construction, the Military Board, with the sanction of Government, have instructed me to convey to you the following observations and orders, to which, in all practicable cases, you are directed to conform.

General Observations.

Nature of the country.

The nature of the country through which a road is to be carried, will require primary attention.. If hilly, the acclivities should be met with due attention to easy ascent, but without too great a sacrifice in distance.

If generally level.

If the country be generally level, but not subject to inundation, the shortest line is of course to be preferred; unless by a *detour* some important advantage may be gained, as avoiding swampy or broken ground, or bad soil; and unless, by diverging but a little from the straight line, soil of a better quality may be found.

If low and partly under water in the rains.

If the country be low, so that in the rainy season it is under water, in such a case much consideration is required, lest the road should be either too much or too little raised. It is essential that accurate levels should be taken, and the greatest height of inundation ascertained. This can only be done by personal inspection in the rains, and that is also the period when the general plan for the drainage of the country (should it be necessary to carry that through the line of roads) can best be formed.

Road through a valley.

In carrying a line of road through a valley, it will not generally be found necessary to raise it to a perfect level. It will be suffi-

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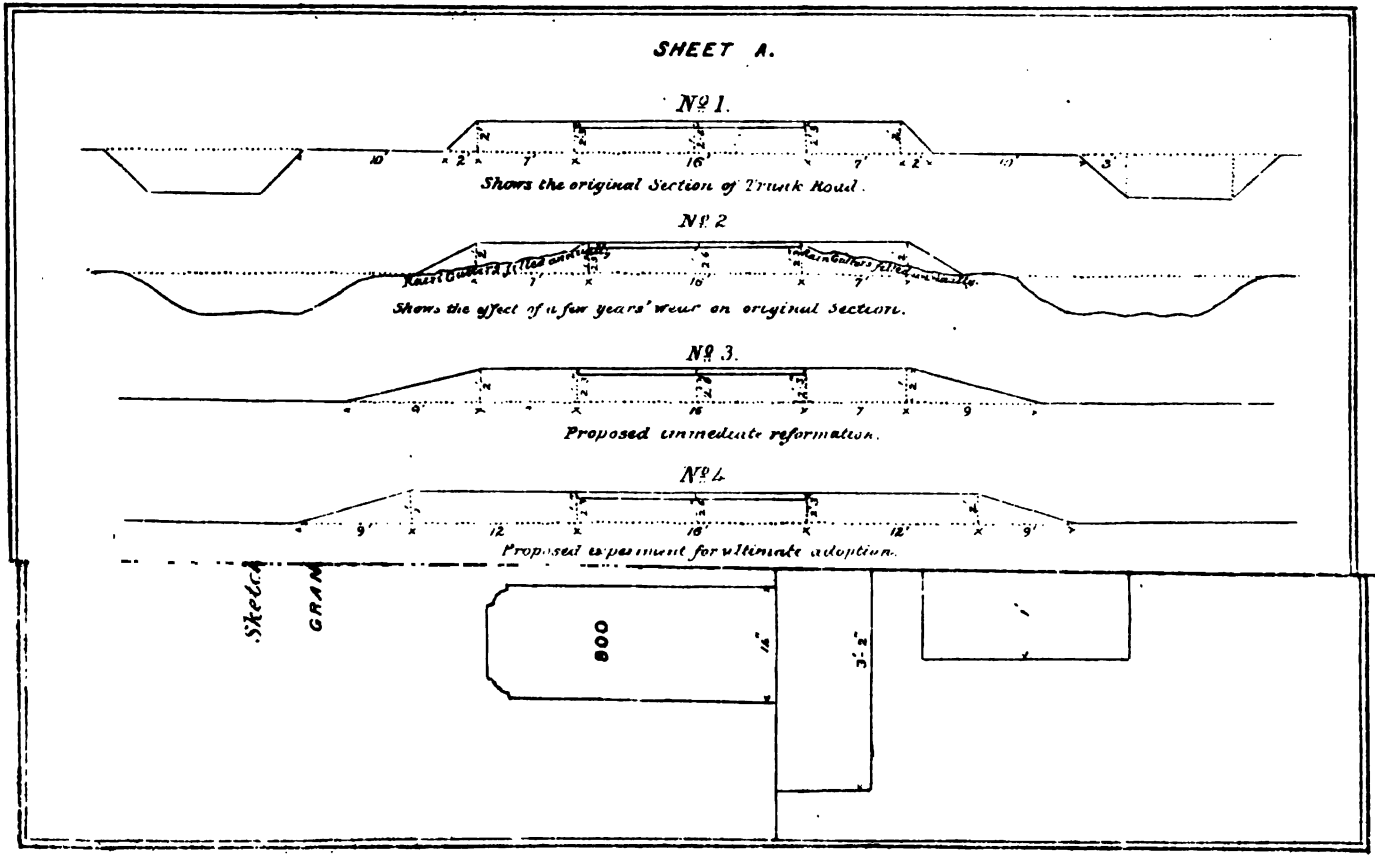

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cient that the embankment shall at all points overtop the extreme height of flood, although it may dip occasionally a little, and undulate with the general contour of the country.

Soils adapted for roads.

The natural soils best adapted for roads are those of kunkur and of gravel, and those which are formed of a mixture of clay with sand. The first and the last form excellent roads with little labor; and where they are found, it may be sometimes advantageous to sacrifice a little distance, for the purpose of profiting by them.

Form prescribed for Roads.

Form, or section, of roads.

Having fixed on the line of roads, the next point for consideration is its form. That is a matter of importance, for on that depends, in a considerable degree, its duration in a perfect state. If it be much raised in the centre, the rain running rapidly off it will quickly wash away its substance, and run it into furrows. If, again, it be flat, the water will not run off, but will so soften the surface that wheel carriages will readily sink in it. These extremes must therefore be carefully avoided, and with that view the accompanying Sections have been approved of, and are communicated for your information and guidance, always keeping in mind that a road should be as *smooth*, as *hard*, as *level*, and as *dry* as possible; that is, that the rain shall not lodge upon it, but yet that it shall be nearly level.

General breadth 30 feet: of which the breadth of metalling to be 14 feet.

The breadth of a road must in some measure depend on the expected traffic on it. For the great western road, however, from Calcutta to Delhi, 30 feet have been deemed sufficient; and where metalled, 14 feet in the centre, of metalling, are prescribed.

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Section No. 1.
For high, hard, and dry ground.
The road to be raised 4 inches higher in the middle than at the sides, in a breadth of 30 feet.
In the profile no sharp angles should be left.

FIGURE No. 1. This is the Section for a road carried over a high and dry kunkur or gravelly soil. This road should not be raised above 1 foot in the centre, and 8 inches at the sides, giving a centre swell of 4 to 6 inches. No sharp angles should be left, either at the verge of the embankment, or where the berm is made to slope off gently into the excavation for drainage; every angle should be rounded off, and covered with sodding, where sodding is used. In this section, the natural sod will grow in the hollow for the drainage, and the cultivation may be extended up to the line of trees, thus requiring for the road a breadth of only 48 feet.

But in metalled roads 3 inches of rise in the centre will suffice; depth of metal 6 inches.

If this road be metalled, 3 inches of rise in the centre will suffice, instead of 4. The depth of metal is 6 inches, and the stratum of metal is to be put on equally thick at all parts, since where roads are nearly flat they will be used at all points.

Section No. 2.
For dry and high ground, but softer still.

FIGURE No. 2. This Section is in all respects similar to the former, except that it is raised 18 inches in the centre, and 14 inches at the sides. The slope of the embankments at the sides should be double its height.

Section No. 2 will answer where the ground is high and dry, but the soil softer, as mixture of clay and sand. This is good soil for roads, and needs no metalling; for although it is a little heavy in dry weather, in the rains it becomes hard and firm, and is not easily washed away. On other points, you are referred to the remarks on Section No. 1.

Fifty feet are required for this road.

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Section No. 3.
For ground rather low.

FIGURE No. 3. This Section is applicable to a road passing through ground that is low, and subject to inundation. The centre is raised 2½ feet; the sides will be 2 feet 2 inches in height. The drainage excavation should be formed here as in the foregoing Sections; but in proportion as the embankment is raised, so must that excavation be extended in breadth inland, so as to furnish earth sufficient for the roads without having recourse to pits or ditches for that purpose, unless the locality shall render that preferable; for, besides injury to the roads and danger to passengers from deep excavations and pits, the ground occupied by them must be lost to the cultivator; whereas the sloping drain, however much it may extend in breadth, admits of cultivation through it, to the verge of the embankment, and the road is thus formed at the least possible sacrifice of ground.

Fifty-four feet in breadth will be required for this road.

Section No. 4.
For ground still lower.

FIGURE No. 4. This Section is calculated for a road passing through ground still lower than the foregoing. It is raised 4½ feet in the centre; the raised embankment to slope 2½ feet horizontally for every foot of height, so that if the wheel of a passing carriage should go over the side of the road, the carriage would not be overturned. In other respects, the same directions as in No. 3 are applicable.

The space required for this road in breadth will be 60 feet, exclusive of excavation ground.

Section No. 5.
For ground still lower, but may be extended to any level.

FIGURE No. 5. This Section is applicable to a road passing through ground still lower than No. 4 Section; but may be extended to any level. The road is raised 6½ feet; in other respects the same rules apply to this Section as to No. 4. The breadth required here

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Where roads are much raised, their slopes should be planted with strong grass.

will be 64 feet. In all cases where road embankments are much raised, the slopes of their sides should, when practicable, be planted with the *surput*, or other strong grass. The roots bind the soil, and the bush above, whilst it covers the earth, breaks and impedes the flow of water down the slope; and thus it affords protection to the road in various ways.

Section No. 6. When the road ascends the verge of a hill.

FIGURE No. 6. This Section represents a road winding round, or ascending in a straight line, the verge of a hill, or descending obliquely from a higher to a lower level; the size of the side drain and the number of the under drains, will of course be regulated by the extent of hill above the road to be drained. The masonry may be of dry stone, if suitable materials can be found. The outside retaining wall must of course have openings for the drainage; and the openings should be numerous, in order to diminish, as much as possible, the rush of water at any one point.

Section No. 7. Where high ground is to be cut through, or a descent made into a nullah.

FIGURE No. 7. This Section represents a cut through a hill, made so as to reduce the acclivity; or it represents a descent into the bed of a nullah. This Section can only apply to a short line, and requires no explanation, except in cases where metal is used, that where there is a declivity, the metalling should extend the full breadth of the road.

METALLING ROADS.

Metalling.

Except in particular places where the soil is bad, it is not deemed necessary to have recourse to metalling; unless indeed the metal shall be found so near the line, as to justify the additional expense. The materials for metalling roads in this country are:—

Various kinds of metal. 1st, Stone.

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Stone of various kinds, when broken down to a proper size; —the pieces should be from one inch to an inch and a half in diameter.

2nd, Gravel.

Gravel. Of this there are two kinds—*pit* and *river* gravel. The former is preferable on account of its roughness, which renders it more adhesive than the smoother kind found near rivers; of which latter indeed, unless it be broken, no good road can be made. The large gravel is better than small, because, after being broken from its angular shape, it is easily compressed into a solid mass, and is the most durable of all materials.

3rd, Kunkur.

Kunkur. This is also a good description of metal for roads; it is durable, and naturally possesses an adhesive property; so that when properly laid down and consolidated, it seems, as it were, to grow together.

4th, *Koah.*

Koah, or bricks, broken down to the requisite size. This is a good substitute for a more perfect material. When the bricks are made from nearly pure clay, or with only a small admixture of sand, they make good metal. If sand predominates, the brick, however well burnt, is friable and easily pulverized, and is consequently inferior as road metal. The contents of the entire kiln should be brought into use—the *jâma* or over-burnt, as well as the *peelah* or under-burnt bricks.

5th, Sand.

Sand. Clean sand, when put upon, and mixed with, a soil of stiff clay, forms a species of metalling, the quality of which has been favorably reported upon to the Board.

New embankments must be allowed to settle, before metalling.

No new road should be metalled until it has been exposed to at least one rainy season; and if it be much raised, two seasons will be still better. Before the metal is laid down, the portion of the road that is to

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receive the metal should be well smoothed; a line of brick on edge should then be laid on each side, to prevent the metal when compressed from spreading outwards; but it is not considered necessary that a foundation of bricks laid flat should be used under the metal; on the contrary, the road would be better were the bricks broken into *koah*, and used in that state, rather than whole.

The metal should be well consolidated.

It is very essential that the metal be well rolled or beaten down, so as to become a hard solid mass, and the smoother a road can be made the better and more durable it will be.

Drains.

Drains, and general drainage of the country.

When a road crosses the general slope of a large tract of country, to provide judiciously for drainage through the line of road, requires the most attentive consideration. Specific rules cannot be framed for such work; but, as a general principle, it is held preferable rather to have many small drains than fewer large ones—to spread the water over a considerable space, rather than to force it into a few large channels.

Trees.

Planting of trees.

When trees are planted along a road, they should not be placed nearer to the artificial embankment than 9 feet; for when their branches overhang the road, the rain which collects on the leaves falls down in large and heavy drops, and materially injures the road; they should not be less than 60 feet from each other, on the same side, and planted opposite to each other.

Native proprietors and others should be encouraged to plant and preserve trees on the highways.

Officers in charge of roads should earnestly encourage the desire which the people of India have for planting trees on the sides of the highways. It is deemed by Government an important object,

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and it is conceived that, by judicious encouragement, the people of wealth, as well as those in more moderate circumstances, would co-operate effectively in its attainment. If complete and continuous rows cannot be formed, the trees must be planted at more extended distances. In so doing, it is thought desirable rather that a considerable vacant space should be left in the line, and then a few—say eight or ten—trees planted at the regulated distance, than that the same number of trees should be spread at equal distances over the same space; since by the former arrangement a large party of travellers would find shelter near together, which single trees at great distances would not afford.

The zealous and economical co-operation of all officers is expected in promoting this work.

Finally, the Military Board are persuaded that the great importance of the object which Government has in view will be sufficiently apparent to you to ensure the zealous and economical co-operation of yourself individually, and of the whole Department of Public Works, without which the great national benefit of facilitating communication through this extended country cannot be adequately realized.

Whenever circumstances may occur which in your judgment shall render it expedient to deviate from the instructions now conveyed, you will be pleased to communicate with the Board.

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No. 2.

GRAND TRUNK ROAD.

SELECTIONS FROM MAJOR F. ABBOTT'S REPORT OF THE GRAND TRUNK ROAD FROM GOORSAHAIGUNGE TO DELHI.

[The following remarks are extracted from reports by Major F. Abbott, Superintending Engineer, North-Western Provinces, on the state of the Grand Trunk Road between Goorsahaigunge (where the road branches off from the line between Cawnpore and Furruckabad) and Delhi. They will be found useful, as being generally applicable to roads metalled with kunkur, and passing through a level country.]

Extract from a letter, No. 3123, dated 2nd April, 1844, from Major F. Abbott, Superintending Engineer, North-Western Provinces, to the Secretary of the Military Board.

GENERAL REMARKS.

Lining out.

29.—One of the main defects in this road is a gross contempt of straight lines, visible throughout. The road winds in every direction—the effect, doubtless, of bribery in the native establishment; each zemindar being naturally anxious to save his own lands. A complete reformation of this defect would cost a great deal of money; but in some places the deflections are so great that it becomes a question whether, when the present metal is worn out, it would not be better to correct the line in part, especially where the ditches and embankments of the old road require much alteration.

Section.

30.—The next remarkable error is visible in the section of the Grand Trunk Road. The surface breadth, 30 feet, is much too narrow for any great line of commerce; and to add to the

STANDARD PLAN.

Fig: 1.

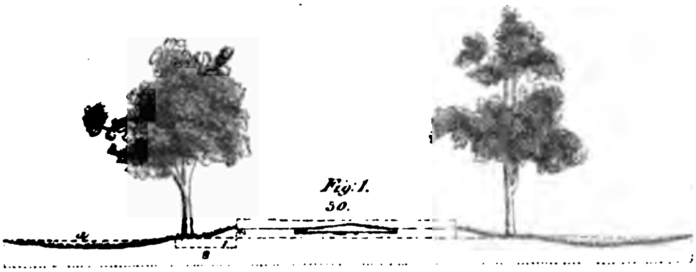


Fig: 2.

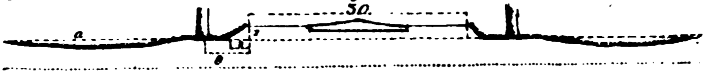


Fig: 3.

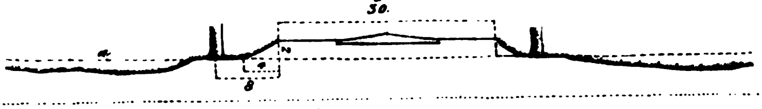


Fig: 4.

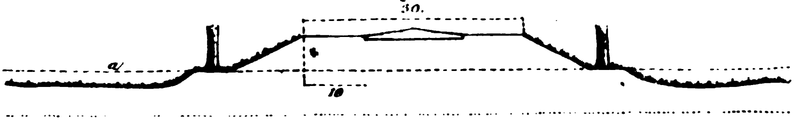
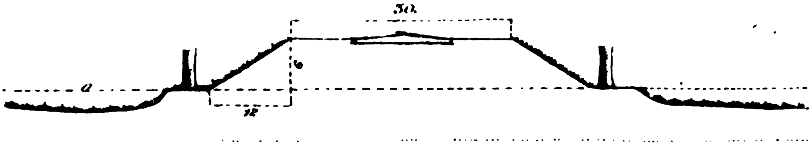


Fig: 5.



a a Excavation to be extended in breadth in proportion to the quantity of earth required for the construction of the Road.

Fig: 6.

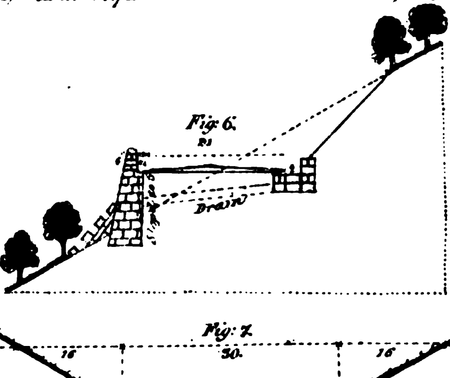
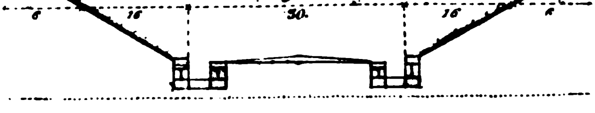


Fig: 7.



Sections referred to in Mr B's Circular Letter on the subject of Roads

(Sd) Jos: Taylor, Lt Col

Supt Engineer. N.W. Provinces.

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inconvenience and danger of so narrow a road, the causeway is raised to a height generally too great, and in many places without a shadow of necessity. The side slopes are steep, and the ditches in many places very formidable. The general height of the causeway it would now be difficult to lessen, without interfering with the speed of the mail carts; but it is worth considering whether it would not be better, on some occasions, to reduce the height of extravagant causeways before giving an entire renewal of metal. The Executive Engineer is now engaged in taking sections, with a view to submit estimates for remodelling the form of the road, by filling up the ditches, lengthening the slopes, &c.

Breadth.

31.—Many suggestions have been made for increasing the surface width of the metalled centre. I do not think that for many years to come it would be necessary to increase the breadth of the metalling. If the metal were 20 feet wide, the country hackeries would confine themselves to one track; —and regarding obstructions, these can be avoided by turning for the moment on to the *kutcha* sides. The advantages to be derived from increased width of metal would not be commensurate with the expense.

Increase of breadth.

32.—The insufficiency of general breadth (30 feet) is rendered more apparent by the present objectionable form of the road. The cost of increasing the width of the sideways would be considerable, and is not perhaps absolutely necessary as an immediate measure. As traffic increases, however, on this line, it will be expedient to add to the width of the road, making the sideways not less than 12 feet. This may be undertaken gradually; and I recommend that in the next annual repairs provision be made for altering the form of 20 miles of road to the section given in Sheet A., *Fig.* 4. The sides should be carefully turfed, and if the advantages of this section become very evident, the

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improvement may be extended slowly or rapidly, according to circumstances.

33.—In the meantime, I deem it absolutely necessary to slope off the banks, and to fill up such of the ditches as are dangerous. Many of the ditches may be left to the action of natural causes; and if the strict prohibition I have given, to refrain from digging any, even the smallest quantity of earth, for repairs from these ditches, be attended to, they will soon be filled by drift sand, and the annual *débris* of the causeway. In Sheet A., *Figs.* 1 and 2, are exhibited the original section, and the effect of wear upon that section; in *Fig.* 3 is exhibited the mode I propose as an immediate reformation. The Board will observe that there are no ditches; this is a *sine quâ non.* Earth must be dug from pits not nearer than 15 feet from the foot of the slope, by which means objections are avoided, and better clay is obtained. The Executive Engineer is engaged in making an estimate for this alteration.

34.—When, however, by the elevation of the causeway the construction of long slopes would spread the base of the road over an unreasonable extent of ground, I propose to make the slope 45 degrees, and to obviate their danger by giving small parapet walls. The necessity for such elevations will occur only in passing swamps and ravines, or in approaching bridges—circumstances comparatively rare; and I fix the height of causeway, to which parapets should be first given, at 4 feet. The side slopes will be formed of moulded clay, like pise-work.

Mud walls ordered by Dr. Ranken.

35.—As a temporary expedient to secure the safety of travellers, Dr. Ranken, Post-master-General, North-Western Provinces, directed mud walls to be given wherever the banks were dangerous. About 23 miles of mud wall on both sides, or 11½ miles running, have been constructed, the walls being 3 feet high. This will be an expensive measure to conti-

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nue. The cost averages at the rate of Rs. 250 per mile, and the wall, being perched upon the soft edge of a steep bank, is liable to be washed away by every heavy shower.

Grass on the slopes.

36.—Some attempts are made to encourage the growth of grass on the side slopes of the road, but, with the stiff slopes generally prevalent, it is a hopeless task. The *dhoob,* when planted at the edges, takes pretty readily in most places, but the sides are too much disturbed by showers, which gutter them; and the grass soon fails under the parching influence of the sun. When the slopes shall be flattened, we may perhaps get the grass to thrive; but in the meantime, I think that it is unadvisable to incur any great expense in attempting to turf them. There is a plant called "*akwa,*" which takes spontaneously to the gentle slopes in many places; it protects the sides, and might be encouraged in other places.

Berms.

37.—Berms have been recommended as auxiliaries to roads. By "berms" I mean spaces left between the causeways and ditch; but I think this is an extravagant mode of applying space: it takes [away a vast quantity of land from cultivation. Thus, a 30 feet road, 2 feet raised, with slopes of 4 inches to 1 inch, covers a space of 46 feet; add 2 berms of 12 feet each, and it covers a space of 70 feet. Now, abolish the berms, and make the *kutcha* sides each 12 feet, which will afford good road on each side of the metal, and the road will spread over a breadth of 56 feet. It is a mistake to suppose that hackeries will take the *kutcha* road whenever they are able. None but the lightest carts going short journeys do so. The heavy and long stage hackeries almost always take the metal, because upon it they can make double marches. Drivers, whose carts used to travel 5 coss a day upon *kutcha* roads, think 10 coss a fair day's

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work upon the metal. Most of the bullocks which now travel the long stages are shod. The expense of doing so is trifling, and the cattle work well upon the kunkur. The long-stage hackeries are now beginning to bind their wheels with iron tires.

Metal, form of.

38.—The breadth of the metalling is 16 feet. Throughout, the section of the metalling has been raised. In the first metalling of the road, Lieut. Hill gave a rise of 7 inches in the centre, which gave it a most inconveniently rounded back; and when the metal began to wear, it assumed the very uncouth and inconvenient figures shown in Sheet B. This error has been since avoided; but the section may be kept still more flat with advantage. I would not allow a greater rise in the centre than two inches, and this should be effected by actual increase of thickness, and not by moulding the clay bed beneath into a convex form, as is generally practised.

Metal, thickness and method of laying.

39.—According to the account of the native establishment, the earlier portions of the metal were laid with kunkur 9 inches deep at centre, and 6 inches at sides. The whole thickness was laid at once, without any sorting of the pieces, and was rammed to hardness by the convicts. Since the rains of 1840, Mr. Sub-Conductor Wood assures me Lieut. Hill's order was to lay only 6 inches throughout the breadth, and ram it (according to Mr. Wood) to 3 inches, which is impossible. Mr. Wood further states that Lieut. Hill allowed only 16 beds of kunkur per mile, each bed containing per calculation 2,400 cubicf eet of kunkur,—*i.e.*, 38,400 cubic feet of kunkur; this, if distributed evenly over the surface of a mile of road 16 feet broad, would give a depth of only 5 and 4-10th inches of loose kunkur, which would beat down certainly to 4 inches. This is much too thin, and such a metal requires absolutely a

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foundation ; or, when half worn, it is unable to support the weight of large carts, and sinks bodily into the clay beneath. This effect I have witnessed in many places, and have ascertained the point by opening out sections of the metal.

Again, with regard to laying the metal 9 inches loose, I feel assured that such a mass cannot be sufficiently consolidated by any means now in operation. I held this opinion in opposition to most of the Europeans employed in the Provinces, and I found it to be perfectly corroborated by an inspection of the new metalling of the Gungeree Bridge causeway, which has been laid 9 inches thick (loose kunkur), and rammed by convicts under the eyes of Sergeant Brine. No pains were spared, and in opening that portion which the Overseer considered the best and most indurated, we found the upper portion, about 2½ inches, very hard and good, but all below that loose and unsatisfactory.

Kunkur, mode of laying.

40.—The plan of laying all the kunkur without sorting can only be admissible where the material happens to be supplied of a pretty even size; but on the lower parts, especially below Bhoegaon, this precaution having been disregarded, the metal is exceedingly rough in many places, presenting large lumps upon the surface, which must be very dangerous to cattle. The same fault is observable on the roads around Meerut.

Kunkur, 2 layers.

41.—Without using the minute sub-divisions into four classes of size, as adopted on the Trunk Road in the Central Provinces, I feel assured that where 9 inches of kunkur (loose) is the standard, it would be better to lay it in two layers; the lower layer of 5 inches, consisting of the larger pieces; the upper of 4 inches, of the smaller. The kunkur should be clean, but all attempts to smooth the surface by rubbing in powdered *bujree*, &c., should be avoided. I prefer seeing the *grain*

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of a well-made kunkur road, and I always suspect a very smooth surface. The labor of this polishing is all wasted, as the powdered surface, after being pasted on, quickly wears off again in the shape of dust.

Metal foundation necessary.

42.—Whilst upon the subject, I would beg to observe that our Indian roads, upon which traffic of any great amount is carried, ought to have a solid foundation below the metal. Raised as our roads generally are above the level of the country, the metal resting upon the artificial mounds, it stands to reason that where the metal is half worn, the remaining part, unable to bear the weight occasionally imposed, sinks into the clay below, breaking and crumbling the parts adjacent. In repairing these holes the clay is again disturbed, and again the same mischief recurs. I would therefore propose, for all new and great lines, that a sub-stratum or foundation of 9 inches of coarse and mixed kunkur be laid, and well consolidated, and that above this the wearing metal be laid, of a sufficient body to beat down to 3 inches ; and that it be a standing rule never to allow the sub-stratum to be disturbed, but by exerting proper vigilance, always to repair or renew the ruts before the *wearing* stratum shall be cut through. This will cause a greater outlay at first, but it will be attended with compensating advantages; and if the course of improvement in travelling and increase in traffic fulfil the present promise, some such system of affording stable roads *must* ere long be resorted to.

Kunkur, wear of; and repairs of ruts.

43.—Expedients have been suggested to keep the country carts from following one particular track, by which the metal is unfairly worn. Every attempt has hitherto failed, and I believe that no plan can succeed. It is inherent in the nature of bullocks to follow the lead, and to keep to any marked path. On considering the subject with much attention, I feel disposed to think that this mode of wear is the most advantageous that could be used. Where the kunkur has been

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well sorted, the ruts wear quite *smooth*, and become a sort of railway for the wheels; all the rest of the surface remains comparatively untouched, and when these ruts grow deep, their repair is very simple, and may be executed without impeding the transit of carriages. Small trenches, 24 inches wide, and *clean cut*, are excavated along the ruts, and then filled with new kunkur, which is beaten down to the surface level of the rest of the road. On some occasions, attempts have been made when repairing ruts, to divert the hackery wheels to other parts of the metal, by raising the new metal above the general surface level. This must be avoided; such repair makes a road misshapen, and awkward to travel upon, and becomes much more difficult to repair. All account of centre is lost, and the state of the metal can only be ascertained by probing.

Mode of repairing metal. Renewal.

44.—The present mode of renewing metal is to take up all the old kunkur, and lay down a fresh stratum 4 inches thick, which beats down to something less than 3 inches. This system I deem to be utterly devoid of any recommendation, and I did not believe that such had been adopted, until I received assurance of it in Lieut. Atkinson's letter, No. 269, of the 19th December. That it is not a cheap plan, is evident from the experiment quoted in paragraph 47; and it is impossible to suppose that 3 inches of kunkur laid upon a surface of clay lately disturbed by the pickaxe, could afford a strong and durable surface for heavy traffic. Lieut. Hill's stratum of 6 inches, I consider too thin. I would have nothing less than a mean thickness of 7 inches.

Repair of ruts.

45.—In repairing ruts, Lieut. Atkinson states that the trenches are filled with 8 inches of loose kunkur, which is beaten down to the level of the surface. I deem this assumed thickness to be unnatural, if not impossible. The original thickness of the metal having been 6 inches, beat down to 5 inches or

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4½, and then worn for three years, can never present a thickness greater than 3½ inches or 4 inches. This I have ascertained from many sections; if, therefore, 8 inches of kunkur are to be applied and beat down to 6 inches, it will be necessary first to excavate the clay stratum 2 or 2½ inches, below the under surface of the old bed. I have directed the overseer never to dig the trenches of ruts deeper than is absolutely necessary. The greatest thickness of metal that I found in recently filled ruts was 3¾ inches.

Cost of metalling.

46.—The cost of metalling varies on different parts of the road, according to the facilities for procuring kunkur. The expense has been considered high, and I have caused the Executive Engineer to consider the subject seriously, with a view to a reduction of rates. The price of kunkur at first starting was enormously high, not less than Rs. 3-8 per 100 cubic feet, and this upon a line running for the most part *over* beds of kunkur. An immense quantity of material appears to have been collected, at a time when the fair rates of material had not been ascertained; so that when Lieut. Pott, the present Executive Engineer, took charge, he found himself burthened with 22,46,372 cubic feet of material at the above high rate. Last year, however, a great reduction appeared in this article, the Executive Engineer having succeeded in obtaining it generally at Re. 1-8 per 100 cubic feet at the quarries; so that a great reduction of charges may henceforth be looked to, when the old stock of kunkur shall have been expended. There is about 10,60,000 cubic feet of it left, valued at Rs. 37,100. This quantity would be expended in 24 miles of renewal.

47.—In August, 1843, Lieut. Atkinson, then acting for Lieut. Pott, carried out by my direction an experiment professedly superintended by himself, but as he did not remain constantly on the spot, I do not place much value in the results, which were as follows:—

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For one mile of metalling, 16 *feet broad.*—(The portion of road experimented on was a fractional part; but I have reduced the rates to a full mile).

	Rs.	As.	P.
7,559 bildars and coolies, ...	676	6	0
Et cæteras, ...	25	9	0
28,160 cubic feet kunkur, ...	995	9	0
	1,697	8	0

It will be observed by this statement, that the quantity of kunkur is only sufficient to give a stratum (loose) of 4 inches, which would ram down to 3 inches. I cannot place dependance on the experiment, especially as it differs in so extraordinary a degree from one made by Lieut. Sharp, near Allahabad, and superintended from first to last by himself; the result of which, when reduced to the standard of a 16-inches road, will be 3,120 bildars and coolies, costing Rs. 412; together with 46,666 cubic feet of kunkur, costing Rs. 1,230. Lieut. Sharp's statement shows very nearly the exact quantity of metal due to a mean thickness of 7 inches, yet he had this quantity beaten down, in four separate courses, by half the number of men employed by Lieut. Atkinson in beating a little more than half the quantity of metal in one stratum. We cannot hope, in ordinary routine, to attain to so great a reduction in labor as Lieut. Sharp did by his personal and unceasing superintendence; but allowing 25 per cent. for inferior superintendence, and we have 3,900 bildars and coolies, costing Rs. 515; and this amount should not, I think, be exceeded on the Grand Trunk Road.

48. From examination of the accounts of Overseer O'Connor, who appears to have been one of the first who reduced in a material degree the price of kunkur, I find that this material may be quarried at the rate of Re. 1-8 per 100 cubic feet; and from Mr. Conductor Wood's

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account, I learn that it can be carted at the rate of 12 annas per mile, which I assume as the mean distance for our portion of the Grand Trunk Road.

When, therefore, the old stock of kunkur shall be exhausted, we may expect the following rate: allowing a full quantity of kunkur for a loose stratum, the mean depth of 7 inches—

	Rs.	As.	P.
Labor, ...	515	0	0
49,280 cubic feet of kunkur at Re. 1-8, ...	739	0	0
Mean carriage of do. at 12 as.,	369	0	0
	1,623	0	0

This does not appear a great reduction, but it must be remembered that it gives a stratum of metal nearly twice as thick as that of Lieut. Atkinson's experiment.

Cost of maintaining Trunk Road.

49. In regard to the lasting qualities of the metal, and therefore the expense of maintaining the Grand Trunk Road, I paid particular attention to the state of the metal on the whole line. It was, however, very difficult to draw an absolute conclusion from the experiment made, as the road had been constructed at various periods, and in several modes; partly, also, by convicts, and partly by hired laborers. From careful inspection by many sections taken along the course of the road, it appears that very good metal laid down at 6 inches (the loose stratum) lasts 3 years, with petty repairs. Between the third and fourth year, the ruts require an entire renewal. That is, two trenches of metal 2 feet broad each, require to be filled and beaten down. This is exactly equal to one quarter of the whole metal. It is difficult, if not impossible, to calculate with any accuracy the durability of the remaining

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portion. In some parts, I found the metal laid in 1839-40 at 6 inches (the loose stratum) presenting a thickness of 4 inches at centre, and 4½ inches at sides, showing the wear to be *nil*; at other places, I found metal laid in the same year to be altogether, or very nearly, worn out. The most ordinary result of my sections were—for metal laid in 1839-40, 3 inches in centre, and sides 3½ inches; and I think we may safely assume, that besides the renewal of ruts after the third year, the whole mass will require renewal in the sixth year, or repairs by degrees to that amount.

50. The earth-work of the road also requires considerable repairs. Clay exposed to continual attrition turns to the finest powder, which is taken up by the winds, especially the gales of the vernal equinox, and in this way is found to part with a stratum about 4 inches in thickness. Again, from the faulty construction of the section, having steep banks and deep ditches, a considerable portion of the causeway is carried into the ditch by rain-water gutters, extending right across the *kutcha* sides, and sometimes invading the metal itself. A reference to two years' annual repairs, shows the average expenditure on the earth-work to have been Rs. 66 per mile, *per annum.*

51. The original cost of the Grand Trunk Road in these Provinces I have found it impossible to ascertain; the work having been performed by convicts, by the starving poor, and by regular hired labor, and under various officers. I shall therefore confine this enquiry to the probable cost of maintaining the line.

52. One renewal of ruts after three years, with one total renewal after six years, are the same as one and a quarter total renewal in six years. By my calculation in paragraph 48, the cost of one mile of metal, when we use

new kunkur, will be Rs. 1613. The expense of year's repairs will be

$$\frac{\text{Rs. } 1613+403}{6} = \text{Rs. } 336.$$

Add to this the cost of earthen repairs as per paragraph 50, and we have the annual repair per mile, equal to Rs. 402. This is independent of the cost of monthly repairs, establishment, &c., &c., Now, from examination of 12 months' current bills, (*viz.*, from 1st May, 1842, to 1st May, 1843,) it appears that the average current expense is Rs. 97 per mile, *per annum*, inclusive of European and Native establishment, as per Appendix C. Therefore, the total annual expense of maintaining the Trunk Road may be assumed at Rs. 499 per mile; or in round numbers, Rs. 500.

53.—On referring to the items in Appendix C., it will be seen that the European establishment amounts to nearly one-half the cost of the monthly repairs. In the course of time, the whole line of road will probably be placed under the Executive Officers of the several Divisions through which it passes, when a deduction may be made for the salary of the Officer, which in my estimate amounts to about Rs. 20 per mile, *per annum*.

54.—In corroboration of my estimate, regarding the extent of repair and renewal, I will observe that the average of the bills for annual repairs of 1842 and 1843, (the only two that have been regularly submitted,) is Company's Rs. 332, my estimate (paragraph 52) is Rs. 402; but it must be considered the fifth and sixth years have yet to run on the greatest portion of the roads; and these years may naturally be expected to give an increased amount of repairs; and I think the coincidence is sufficiently close to justify my assumption.

Bridges.

55.—The whole line of the Grand Trunk Road between Goorsahaigunge and Ghazeeabad is complete in bridges. From Ghazeeabad to Delhi, the unfinished bridge of 400 feet water-way

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on the Hindun occurs. From Hindun to the left bank of the Jumna at Selumpore, the road is fully bridged. Then occurs the bed of the Jumna, requiring two small bridges, and one large one, of boats, to complete the communication with Delhi. Between Goorsahaigunge and Ghazeeabad is a distance of 180 miles. There are 317 bridges and drains, with a total water-way of 1,155 feet, or about 10 feet of water-way per mile. There is one bridge of 20 feet, one of 14 feet, and two of 12 feet, span; all the rest are less than 10 feet. This is attributable to the line of road running in a parallel with the general drainage of the Doab. The total cost of these bridges is Rs. 23,786-3-7; or about Rs. 160 per mile.

56.—One great mistake, arising from false economy, is visible in the construction of many of these bridges. They are narrower than the road; the latter being 30 feet broad. There are two bridges 16 feet broad; three of 20 feet; forty-three of 21 feet; and twenty-seven of 26 feet; the rest are 28 feet broad. Some of the narrowest are very dangerous; and they must, I think, be eventually removed. All were built originally without parapets, but this omission is in the course of rectification; indeed, the whole of the parapets must be nearly completed by this time. The masonry of some of the old bridges built by contract is of the worst description; that of the later ones is generally good; but traces of unpractised hands are visible in the voussors of many of the ditches.

57.—Besides the above-mentioned, there is the suspension bridge on the Hindun, not yet finished; 14 small bridges are complete between the Hindun and left bank of the Jumna; and the Jumna itself remains to be considered as to a permanent mode of communication.

58.—In order to facilitate reference, I have directed the Executive Engineer to mark in large figures the number of each bridge, commencing at Goorsahaigunge.

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Experimental groves.

59.—The Military Board, in their Secretary's letter No. 7750, dated 14th April, 1842, called for an estimate for planting groves of trees along the line of the Grand Trunk Road. On 14th August, 1843, I forwarded under cover of my letter No. 1157, Lieut. Atkinson's estimate, amounting to Company's Rs. 6,114-9-4. This estimate professed to be based on the actual experiment of ten groves. These groves I visited on my tour; they are at the following places :—

Keeria,	Goolooea,
Sultangunge,	Nubbeegunje Serai,
Bhoegaon,	Chibramhow,
Bewar, (bungalow),	Sikunderpore.
Ruttunpore,	Goorsahaigunge.

These gardens differ much in size, and contain from 50 to 400 trees; a ditch and bank enclose the area. The bank is planted generally with *sissoo* and *peepul,* which love that style of soil. The areas are planted chiefly with mangos, set 35 feet apart. The average of planting and forming the gardens has been Rs. 20-8-5 per garden; and the expense of each garden, is Rs. 3 *per mensem,* which expense must be continued for five years certainly, although Lieut. Atkinson assumes only four years. Each grove at five years old will have cost about Rs. 200; and if then they be capable of thriving without further assistance, this amount will not be considered great, considering the utility of the undertaking, and the *eclât* that such works always give to a Government.

Proposed improvement in groves.

60.—I should wish to introduce a little change in the system of managing these plantations. At present the native plan is followed; equal distances are marked off; and to provide against too probable loss of some of the young plants, three or four are set together in the same *houze.* The evil

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of this system becomes evident when the trees grow up; for then these trees being unable to find nourishment in the space due to one, each tree becomes stunted. I proposed, therefore, to the Executive Engineer to set the plants singly, and to provide against death by increasing the number of the young plants, setting one in the centre of each square, *quincunx* fashion. These, when they have attained a riper age, may be thinned and planted out in new places, or at chowkees or other particular spots on the road-side, or they may be given to zemindars. The existing plants are generally healthy, though at Goolovia they appear to be neglected.

61.—I would also recommend a greater variety of plants. Many of the gardens contain in the area nothing but mangoes. A little attention to the natural foliage of the country would enable us to produce beautiful effects. Tamarinds should be more encouraged, as well as the *burgat* and *peepul.*

* * * * * * * * *

63.—I beg strongly to recommend a continuation of this system, making, as proposed in the estimate before alluded to, one grove at every five miles. The traffic on this road is increasing very fast. The number of travellers along it is enormously multiplying, and these last cannot fail to observe the benevolence of Government in such works, and to spread abroad the fame thereof.

64.—It has been supposed impossible to get up avenues of trees along the Trunk Road. A proposal I made to plant trees in this manner was rejected by the Military Board, in the Secretary's letter No. 7750, dated 14th April, 1842. I have, however, since witnessed very successful attempts made by Road Committees, on the road from Allygurh towards Hattrass, from Bareilly to Shahjehanpore, and from Bareilly towards Pillibheet. The matter re-

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quires only a little care and expense. In many places, the native residents would plant if encouragement were given them ; and when the groves are planted at each five miles, I do not despair of seeing them connected, by planting out the surplus plants along the road-side.

Milestones.

65.—The measurement of the Grand Trunk Road has not yet reached my division. This argues some mismanagement in the lower district. It is a matter that should be set at rest, as our distances are very vaguely defined. Many of the milestones of the old road are still in existence. Most of them have been brought to the side of the Grand Trunk, and there set up at a guess. In Mr. Secretary Hamilton's letter No. 3488, dated 29th July, 1843, the Lieutenant-Governor was pleased to sanction a pattern of milestone and obelisk for the roads of the North-Western Provinces. But the Trunk Road is one requiring a peculiar style of milestone, the pattern of which should be fixed by the Board, so that all may be alike, from Calcutta to the future terminus. I annex a sketch of one that I should propose. The stone to be rather heavy, and fixed in masonry, well clear of the road-side. The distance from Calcutta should alone be marked. The distances of intermediate towns will be marked on separate milestones by Local Committees. The Board should also decide on which side of the road the Calcutta milestone should be erected, so that uniformity may be observed throughout.

Extract from the same Officer's Report to the Military Board, No. 25, dated 3rd May, 1845.

General Remarks.

21.—In my former report, I suggested the propriety of correcting the curves of the line, when it became necessary to renew the metal. Upon more mature consideration, I think it

Lining out.

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better to retain the old line, excepting in certain places where (as at Coel) very exaggerated loops may be cut off, at little cost. By the mode we propose to adopt in renewing metal, very little of the old metal will be actually dug up; and by retaining the old line, we shall avoid the great expense of a new one, as well as the inconveniences of a *fresh* causeway under the metal.

Section.

22.—The same reasons, nearly, lead me to give up my first intention of reducing the height of the causeway, with exception to one or two very exaggerated parts; and, besides, the inconveniences of disturbing the subsoil, and the annoyance to traffic caused by shutting off long portions of the road, would be extreme. The new system of sloping, also, has materially corrected the evils of high causeways; and the heights of existing bridges are so many obstacles to improvement, that I cannot contemplate the expense of renewing those structures, to conform them to the reduced height of the causeway. One or two dangerous places will, however, be reduced in the progress of renewal.

Side slopes.

23.—Agreeably to the recommendation contained in the 33rd paragraph of my last report, the greater portion of the slopes have, with the sanction of the Military Board, been corrected to four of base to one of height, and many objectionable holes and ditches have been filled in. The improvement wrought by this simple and comparatively inexpensive alteration is remarkable, and would scarcely be credited. Indeed, I do not hesitate to say that the traveller who had seen the dangerous section of last year, would find difficulty in believing himself to be upon the same road. Scarcely any wall-work has been found necessary, and Lieut. Becher thinks that, generally speaking, it will be cheaper to carry out the full slope than to give walls. Some little difference of opinion occurs on this head; but I have sanc-

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tioned his making the experiment with some exaggeratad causeways, as the wall is certainly an ugly thing, and detracts from the general breadth of the road. I trust, also, that by Lieut. Becher's good management, the annual expense of keeping up these improved slopes will not be greater than hitherto. Indeed, when the turf and *akwa* shall have fully taken root, the expense of side repairs will be greatly reduced. I wish the Military Board could see the improved section.

Increased breadth.

24.—Government have been pleased to sanction the important experiment of widening out the road to 40 feet. A small piece on this principle had been laid off for my inspection; and I may be permitted to observe that if the whole be carried out, the Grand Trunk Road will be a noble monument, worthy of a great Government. The Military Board expressed surprise at the assertion made in the 37th paragraph of my last report,—*viz.*, that almost all loaded hackeries take to the metal, and that none but light hackeries, going short journeys, prefer the *kutcha* sides. This opinion is daily confirmed. Lieut. Becher and I took some trouble to observe the state of the question as we walked up the road; and I may fairly assert that for one hackery on the earthen side, we found twenty upon the metal. It is perhaps wrong to say that heavy carts *never* go on the sides; they do so at times as a rest to the bullocks' feet; they will go three-fourths of the journey on the metal, and the remainder on the *kutcha* side. This applies to unshod bullocks; those that have shoes keep the metal throughout. I can understand that during the early introduction of the system, and when it was not very perfect, the cattle-drivers may have objected to the metal; in many places they are forbidden on Local Committees' roads to use the metal for fear of wearing it out; and thus perhaps many travellers still think the metal is everywhere reserved for the *Sahib logue;"* but the reservation has been loudly complained of to me

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by wayfarers, and I have done all in my power to get public roads thrown open unreservedly to the public. Yet it must not be argued that because the metal is preferred, it is useless to widen out the *kutcha* sides. Width of road is always necessary, for the sides are much cut up by rain, so that at certain seasons there is none left of the seven feet of *kutcha* side, and there is no room for carts to avoid the fast mails; whereas with twelve feet sides, I think we shall always be able to retain a sufficient track on each side of the metal.

Mode of repair.

25.—Although I still hold to the opinion set forth in the 39th paragraph of my last report, as to the expediency of giving a solid substratum to our roads, yet as the necessity of immediately assisting a very large portion of the road appears by the above paragraph to be urgent, whilst our means are limited, I have proposed to Lieut. Becher to overlay the old metal as it stands (without touching it with the pickaxe) with a stratum that will beat down to 3 inches. By this means, we shall be able to place in security and in fine order 100 miles of road this year; whereas if we were to renew with a stratum 9 or 12 inches thick, we should hardly execute 50 miles. When this new stratum becomes in want of repair to great extent, I propose to cover it again with 3 inches of metal. Lieut. Becher perfectly concurs with me in these views, and he is making arrangements accordingly. This mode was suggested by the Military Board in their Secretary's letter No. 1236, dated 21st June, 1844, para. 11. The only exceptions will be the round-backed sections, which will not answer as sub-strata, and one or two violent causeways.

Advantage of single layers.

26.—There is another important advantage gained by this mode. It is that, by laying a single and thin layer, this layer will be well consolidated, as no portion of it can be concealed from

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the eye of the Superintendent, or of his Overseers; whereas, on opening out metal 9 inches thick, beaten in two separate layers, I have invariably found the lower layers to be inferior in compactness. The eye of the Overseer cannot be everywhere, and the workmen slur over the lower layer, hoping to make all right by finishing the upper one in proper form. The error thus incurred is of a very serious nature, and very few Overseers apprehend it; it is this, that when the upper layer grows thin, it sinks bodily into the lower one, which is indeed not one whit better than good clay. This is a point deserving the deep consideration of all officers in charge of metalled roads.

Objections, fallacy of.

27.—Many very intelligent Overseers and contractors argue against this point, and contend that unless the upper layer *binds* with the lower, it is inferior in quality, and will work up; and that to secure a proper bond the lower layer must *not* be beaten to hardness. Nothing can be a greater fallacy, as is shown in the new mode of repairing ruts. Formerly, the old metal was cut out down to the very clay; since my last report, it has been the custom to smooth out just so much of the rut as has been worn down, filling in with a thin coat of kunkur, say 2 or 2½ inches. If the kunkur be suitably sized,—*i. e.*, if the pieces be not too large,—this forms a perfect repair, and wears as well as the thickest stratum would.

Price of kunkur.

28.—I am very happy in being able to report a vast improvement in this item. In the early stages of the Grand Trunk Road, the price of kunkur laid down at the road-side was Rs. 3-8 per 100 cubic feet, and a vast stock was left by Lieut. Hill at this price. Lieut. Pott reduced these rates considerably, and obtained kunkur at an average of Rs. 2-4 or Rs. 2-8 per 100 cubic feet, at the road-side. Lieut. Becher applied himself to greater reform; and he is at present obtaining kunkur at something like Re. 1-10 per

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100 cubic feet, at the road-side. It is impossible as yet to fix the exact average, as much of the price depends upon the carriage, and this cannot be properly regulated until the map of the road is completed; and then I expect that Lieut. Becher will complete his arrangements, and reduce the price of kunkur to a minimum. The following are the rates at present contracted for in the Northern Division, where the beds are abundant, and underlying three feet of clay generally :—

For digging and carting 1 *pymanah* of 1,200 cubic feet, or 1,000 maunds, to 1,000 feet from quarry, Rs. 12 0 0

Ditto	ditto	1,200 feet	ditto,	13	0	0
Ditto	ditto	1 mile	ditto,	15	0	0
Ditto	ditto	1½ ditto or 1 kôss	ditto,	16	8	0

For distances exceeding one koss, the payment will be at the quarry, Rs. 10-10 per 100 maunds, for each koss (of 1½ miles).

Digging kunkur.

29.—In order to reduce the rates and contracts to something like system, Lieut. Becher has caused four experiments to be made, the means of which gave Rs. 9-0-5 for a *pymanah*, containing 1,000 maunds or 1,200 cubic feet; or an average of 12 annas per 100 cubic feet *at* the quarry, or Rs. 9 per *pymanah*. This appears to me to be a rate which can hardly be reduced, and indeed one which can only be kept as a sort of standard of minimum. Some little profit must be made by contracts, or no undertakers will come forward; but by keeping the contracts up all the year round, and allowing the contractors to supply the material at their own convenience as to seasons, they can manage to derive some profit even from our minimum rates, which are calculated for hired labor; because at certain seasons, when the fields require no attention, the contractors can procure hands at rates little exceeding the price of a seer of atta, and such is the common practice amongst the natives.

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Carriage of kunkur.

30.—The next experiment made was that for the rates of carriage. Both Overseers superintended the experiment, and it was found that a two-bullock hackery, costing 8 annas per day, could travel 4,200 feet in 29 minutes, or about 1¾ miles per hour, carrying a load of 12 maunds. It took by some experiments 15, by others 16 minutes, to load and despatch the cart. From these data Lieut. Becher constructs his formula for adjusting the rates of carriage:—

Let $x =$ the number of trips, working 10 hours per day at the distance a;

$2\ x =$ the number of journeys to and fro;
$2\ ax =$ the distance travelled. Then,
$\frac{2\ ax}{1{\cdot}75} =$ number of hours travelled; and as it takes 15 minutes to load the cart each time,

$$\frac{2\ ax}{1{\cdot}75} + \tfrac{1}{4}x = 10, \text{ or } 8\ ax + 1{\cdot}75 = 70.$$

$$x = \frac{70}{8\,a + 1{\cdot}75}$$ is the equation from which are deduced the following:—

For one mile the equation becomes $\frac{70}{9{\cdot}75} = 7\tfrac{1}{4}$, say 8 trips.

1½ " " " " $\frac{70}{13{\cdot}75} = 5$, nearly.

2 " " " " $\frac{70}{17{\cdot}75} = 4$

3 " " " " $\frac{70}{25{\cdot}75} = 2\tfrac{1}{2}$

4 " " " " $\frac{70}{33{\cdot}75} = 2$ trips.

The expense is thence deduced as follows:—

		M.		Rs.	A.	P.
1 mile	....	96 : 8	: :	100 : 0	8	4
1½ "	....	60 : 8	: :	100 : 0	13	4

		M.	Rs.	A.	P.
2 ,,	....	48 : 8 : : 100 :	1	0	8
3 ,,	....	30 : 8 : : 100 :	1	10	8
4 ,,	....	24 : 8 : : 100 :	2	1	4

32.—The above will show the attention with which the subject has been treated, and the economy of the contracts made this season. It likewise shows the great importance of an accurate chart of the quarries, towards the preparation of which the Military Board have been good enough to sanction a small temporary surveying establishment. On the completion of this chart, the general average will be calculated with great accuracy.

Cost of metalling 4½ inches thick.

33. In the 26th paragraph, I have stated our project of renewing this year with 4½ inches of loose kunkur, which will make a hard stratum of metal, about 3 inches thick. Lieut. Becher estimates the cost as follows:—

	Rs.	As.	P.
31,680 cubic feet of kunkur at Rs. 1-8 per 100,	485	0	0
Labor, ...	230	0	0
Co.'s Rs. ...	715	0	0

The kunkur is here supposed to be carried two miles. The experiment made by Lieut. Atkinson in 1843, as mentioned in the 47th paragraph of my last report, gave a rate equal to Rs. 1687-8-0 per mile, for a loose stratum only 4 inches thick. So that if Lieut. Becher's rates are carried out in practice, and of this I entertain no doubt, he will have reduced the rates by more than 50 per cent.; which, if we take the average renewal, including ruts, at 30 miles, would effect a saving of not less than Rs. 27,000 *per annum* on this portion of the Grand Trunk, and which would pay the whole establishment for two years.

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Cost of metalling 9 inches thick.

34. Although our operations this year will be chiefly confined to strata of 4½ inches, loose, yet in some places where the section is much disfigured, it will be necessary perhaps to dig up the old work; and although, in most of these cases, I should prefer renewing with 4½ inches of loose kunkur, as mentioned in paragraph 27, yet it is well to prepare for occasional layers of 9 inches, loose. Lieut. Becher estimates this as follows:—

	Rs.	As.	P.
63,360 cubic feet of kunkur, at Re. 1-8 per 100,	970	0	0
Labor, ...	450	0	0
Total,	1,420	0	0

This rate goes far below my best hopes of 1844, and the average cost of 9 inches metal last year was Rs. 1,800 per mile; and this latter rate has been vastly reduced since my report upon the Trunk Road.

Cost of repairing ruts.

35.—Ruts are repaired, by cutting clean troughs, 24 inches broad, and about 2½ deep. Lieut. Becher estimates for repair of 1 mile of double ruts, as follows;

	Rs.	As.	P.
6,160 new kunkur at Re. 1-8,	95	0	0
Labor, ...	90	0	0
Total,	185	0	0

Or about 40 rupees per mile less than last year's estimates, which estimates have also been much reduced.

Contract system.

36. Almost all the kunkur has lately been supplied by contract, and some of the repairs of earthen sides have lately been contracted for. In the Military Board's letter, No. 6772, dated 21st February, 1845, the orders of Government were com-

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municated, to endeavour to execute the whole of the works by contract. Lieut. Becher has therefore issued an advertisement, calling for tenders.

37. The supply of kunkur, the construction of earthen causeways, the repairs of sides, and such like work, will certainly be more economically executed by contract; indeed, these have generally been contracted for. The great trial will be in laying down the metal. At present, the natives appear to be afraid of undertaking the contract, knowing the requisition of the department in regard to the quality of work. They are also generally in utter ignorance of the approximate rates. Some whom we sounded on the road-side—men who had been contracting for the supply of kunkur—asked more than our own working rates. Others, Lieut. Becher informs me, are coming forward, saying, "What are your rates? Give us Rs. 50 less per mile." It is to be hoped that some Europeans of respectable character may come forward, but even in this case the utmost vigilance will be required; for if the European contractor undertakes more than he can personally superintend, and if he cannot afford to place European assistants under him, he will be deceived in the work. In either case, it will be absolutely necessary to increase the number of Overseers on the Grand Trunk Road between Dehli and Goorsahaigunge. I have lately had cause to condemn a great quantity of metalled road made for the Boolundshuhur committee, by an European contractor of great respectability, Mr. Greig.

38. I cannot pretend to say what reduction the contract system will make in the rates of metalling; but Lieut. Becher will do all in his power to introduce it, at least upon trial, as he is most anxious to free himself from the labor of accounts, which at present occupy much of his and the Overseer's time, and render their personal superintendence less efficient.

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39. The main portions of the bridges are in good order. All have parapets, but I regretted to observe some very bad masonry in the parapets of the Southern Division, the cement being of the worst kind. The materials of the parapets in the Northern Division were better, but in some cases the walls were giving way at the wings for want of proper foundation. The Overseers complain that the size of their divisons, 90 miles each, prevents their seeing everything properly executed. No attempt had been made before Lieut. Becher joined, to number the bridges. The work was only half advanced during my inspection. It must now be finished, and it will afford great facility in keeping a register of the condition of the road; for, without such land-marks, it is very difficult to make accurate notes.

Bridges.

40. Ten groves of trees were mentioned in my last report, and four more had been formed ere the receipt of the Hon'ble the Lieutenant-Governor's prohibition. All the groves are in good and flourishing condition; the improvements recommended in my last report have been carried out. The cost of making and preserving these groves up to 1st January, 1845, has been Rs. 872-6-5. The average expense of forming one grove is Rs. 32-6; the average annual expense of keeping it up is about Rs. 19. These are small sums, and the current expense even is calculated to cease in five years. The upper portion of the Grand Trunk is lamentably barren of foliage. Will these sums be considered inadmissible by Government, with advertence to the ultimate decoration of the country and the comfort of travellers? Only one symptom of planting on the part of private munificence is visible, and this consisted of a few trees near Secundra Rao.

Groves.

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Chowkees.

41. An estimate for constructing 18 chowkees between Delhi and Goorsahaigunge was transmitted on the 25th April last, amounting to Rs. 15,656-14-6. I hope that it will meet with favorable consideration, as I consider it very necessary that the officer and his Assistants should have the means of moving rapidly along the road, which they cannot do if obliged to march with tents. When large works are going on, the work-people always get intelligence of expected visitation, so that unless the Superintendent's movements are brisk, he cannot discover the real condition of the work.

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No. 3.

CONSTRUCTION OF METALLED ROADS AND BRIDGES BY LOCAL COMMITTEES.

EXTRACT *of a Letter from* LIEUT.-COL. A. H. E. BOILEAU, SUPERINTENDING ENGINEER, CENTRAL PROVINCES, *No.* 3562, *dated Allahabad*, 1*st March*, 1849, *to the address of* J. MUIR, ESQ., C. S., *Secretary Local Committee, Azimgurh.*

PARA. 2. Mr. Martin is, I think, quite right in stating that the kunkur laid upon your roads has been imperfectly consolidated, and should have been well rammed when first laid down; for though considerable traffic of iron-bound cart-wheels might improve the metalling in this respect, if the tires were not too narrow, yet the continual transit of irregularly shaped wooden wheels (which are so soft that the points of the fragments of kunkur penetrate and disfigure them) causes mutual injury to the road and to the cart-wheels; and destroys the metalling in a shorter time than would otherwise have happened.

3. I also agree with Mr. Martin in reprobating the pernicious practice of cutting deep ditches at the foot of the sloping sides of embanked roads, which, though saving a trifling part of the first cost of making a road, adds enormously to the subsequent expense of maintaining it. After allowing a fair slope for the side of the road, (not less than 1½ or 2 feet of base to each foot of perpendicular height,) a berm, or slip of level ground, should be left, a few feet in width, according to the height of the embanked road, before any cutting is made for excavating soil to make that embankment.

4. The following extract, from a statement of Lieut. D. Briggs' rates of executing various kinds of work on the Great Deccan Road, may be of use to your Committee.

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EXTRACT.

Cost of cutting Jungle, as executed in 1847.

Quantity of work done, ...	4,22,98,000 superficial feet.
Cost in Co.'s Rs., ...	3,686 10 8½
Average per 1,000 superficial feet,	0 1 4¾
Average per man, ...	1,739 superficial feet.

And the distance being 150 running miles, cleared to a width of 53 feet, the rate per running mile is Rs. 24-9-3.

5. *Cost of lining and clearing Road.*

Quantity of work done, ...	1,05,39,620 superficial feet.
Cost in Co.'s Rs., ...	14,110 13 8
Average per 1,000 superficial feet,	1 5 5
Average per man nearly ...	135 superficial feet.

And the distance being 133·076 running miles, 15 feet wide, the cost per mile cleared was Rs. 106-0-7; or if divided among the whole 150 miles, the average would be Rs. 94-1-2.

6. *Cost of excavating Ghâts, both for Hills and for Nullahs.*

Total, ...	24,48,551 cubic feet.
Cost in Co.'s Rs., ...	7,192 8 3
Average per 100 cubic feet, ...	0 4 8½
Average per man about	32 cubic feet;

and Rs. 47-15-2½ per mile for 150 running miles.

The above rates apply to the difficult country lying between Seonee and Kamptee, near Nagpore, where even the plain earth-work required for the raising of roads costs about 5 one-twelfth annas per 100 cubic feet, which is three or four times the rate of similar earth-work near Allahabad.

7. I have also the pleasure of subjoining for the use of your Committee various rates prevalent in the Allahabad Division, supplied by Captain J. Laughton, *viz.*:—

Pucka Masonry, with 12-inch bricks of the commonest *Buharooa* lime, unplastered—

Foundation ... @ Rs. 8 1 3 per 100 cubic feet, and
Superstructure @ „ 8 5 6 per 100.

Plain Pucka Masonry, roughly pointed @
Co.'s Rs. 8 13 6 per 100 cubic feet.

Superior Masonry, with 12-inch bricks, and lime mortar of fine quality, unplastered—

Foundation ... ... @ Rs. 9 9 10 per 100 cubic feet, and
Superstructure ... @ „ 10 5 10 per 100.

Superior Pucka Masonry, with 9-inch bricks unplastered—

Foundation @ Rs. 12 10 0 per 100 cubic feet, and
Superstructure @ „ 13 1 9 per 100.

Arch-work, with 12-inch bricks and fine lime mortar @
Rs. 11 0 7 per 100 cubic feet.

Inferior Lime Plaster @ Re. 1 2 7 and
Superior Lime Plaster @ „ 1 9 4 per 100 superficial feet.

8. *Earthen Walling*, @ Re. 0-8-0 per 100 cubic feet, or at 5 annas per 100, if water is close at hand.

Excavated Earth-work, for sinking a well 5 feet in diameter, and 39 feet deep at Re. 0-4-5¼ per 100 cubic feet.

Earth-work for Roads, six inches high, @ Re. 0-1-0 per 100 superficial feet, brought from a distance of 20 feet.

Earth-work for Embankments, brought from a distance of 223 feet, rammed and dressed, but without turfing. Height of embankment, about 30 feet; exterior slope, 94 feet; surface width, 28 feet;

Rate per 1,000 cubic feet, Rs. 2-4-1, or Re. 0-3-7·3 per 100 cubic feet.

9. I have further the pleasure of subjoining for the use of your Committee a table of the probable cost of bridges of various spans, drawn up by Lieut. D. Briggs.

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Roadway, 20 feet wide throughout.

Arches.	Span.	Height.	Masonry.	Probable Cost.		
	Feet.	*Feet.*	*Cubic feet.*	*Rs.*	*A.*	*P.*
1	2	2	316	36	2	8
1	4	2	618	72	3	7
1	4	4	661	77	1	3
1	6	3	558	63	9	8
1	6	4	439	78	6	5
1	8	2½	775	90	0	5
1	8	5	1,562	178	10	10
1	10	5	1,184	142	7	1
1	10	6	2,288	261	14	3
1	12	5½	1,830	204	1	6
1	12	8	2,750	314	15	1
1	15	8	2,807	309	7	10
1	15	10	4,785	546	2	5
1	18	9	3,659	401	7	9
1	18	9	4,802	540	14	0
1	24	12	5,942	690	10	8
1	24	12	8,181	922	11	6
1	30	16	8,827	1,175	8	5
1	35	22	15,176	2,007	3	7

10. The above abstract was made after Lieut. Briggs had begun to work upon my very economical principle of an Elliptical Tunnel,* lying almost without any foundation upon very bad soil, but with its floor sunk a foot or more below the bed of the water-course, to guard against undermining by the current; which was further provided for by drop-curtains of masonry, such as would be called front and rear deep foundations, in bridges of the ordinary construction.

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* See p. 70, No. XXIII., in Part VII. of the Selections.

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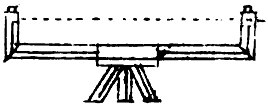
11. The following is an abstract of Lieut. Briggs' estimate for bridges of the common kind :—

Arches.	Span.	Height.	Masonry.	Probable Cost.		
	Feet.	*Feet.*	*Cubic feet.*	*Rs.*	*A.*	*P.*
1	4	3	960	105	0	0
1	6	5	1,792	196	0	0
1	6	7	2,738	296	0	0
1	8	6	3,261	352	0	0
1	8	7	5,265	563	0	0
1	10	7	6,037	640	0	0
1	12	8	8,708	932	0	0
1	15	9	10,187	1,158	0	0
1	20	10	13,608	1,472	0	0
1	20	14	18,272	1,973	0	0
1	25	15	18,357	1,987	0	0
1	30	23	30,113	3,255	0	0
1	34	20	31,031	3,356	0	0

The tunnels in each of the above being 24 feet long, the parapets 2 feet thick, and roadway 20 feet wide.

12. I now purpose making a few general observations, which may be of use to your Committee, as connected with road-making and bridge-building. The question of a levelling instrument has already been mooted in the correspondence with Major A. Knyvett; and though I think that Government would probably sell one to the Azimgurh Committee out of the Arsenal at Fort William, or from the Allahabad Magazine, (if there is one,) yet the price would probably be about Rs. 250, and a simple instrument might be made as a substitute at a tenth of that cost. A tube of brass, lead, or tin, about a yard long, is to be bent up about 3 inches at each end, and a couple of Eau-de-Cologne flasks or medicine phials, with their bottoms cut off, are to be cemented one into each end of the pipe, (as in the marginal figure,) so that when the pipe



is filled with any colored fluid about as high as the middle of the glass phial, and the whole apparatus is stuck on a tripod-stand, it forms a cheap and tolerably efficient levelling instrument.

13. Where embankment-work was to be carried to a height of several feet above the plain, I have found it convenient to drive long stakes (or *bullees*) firmly into the ground, in two rows, 30 feet asunder, (or whatever was to be the top-width of the intended road,) the stakes being about 50 feet asunder, and their heads exactly at the required level above the ground, so that they not only marked the alignment of the road, but showed the precise height to which the earth-work was to be raised. I also had lines cut in the ground, to mark the foot of the intended slope at each side, and another pair of lines to mark the width of the berm; not allowing any earth to be excavated from within those lines: in which manner the work costs fourteen annas per 1000 cubic feet,—the embankment ranging from 1 to 5 or 6 feet in height.

14. Regarding the necessity for bailing out the foundations of considerable bridges over large streams, it may be as well to mention, that in constructing the iron suspension bridge of four or five openings over the Kalee Nuddee, at Khuda Gunj, between Futtehgurh and Cawnpore, my brother, Lieut. Colonel J. T. Boileau, (now Superintending Engineer, North-Western Provinces,) diverted the current to a considerable distance by an artificial cut, and by embankments: thus raising his piers with little difficulty. An opposite plan was pursued at Indree, on the Western Jumna Canal, above Kurnaul, where a suspension bridge of 100 feet span was built on dry ground—upon the isthmus, as it were, formed by a curved reach of the canal; and when the bridge was finished, a cut was made under it, bringing the stream between its abutments; and the old channel was of course abandoned. Either of these plans

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may occasionally be found very advantageous to your Committee. And to make the Allahabad rates given in my 7th paragraph more complete, I may add, that the price of well-burnt 12-inch bricks is Rs. 7½ per 1000; of fine stone lime, 8 annas per maund; of best kunkur lime, Rs. 22 per 100 maunds; of common kunkur lime, Rs. 11 per 100 maunds, and of *soorkhee*, 1 anna per maund.

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No. 4.

FORMATION AND MAINTENANCE OF THE GRAND TRUNK ROAD.

No. I.—EXTRACT *of a Letter, No.* 1306, *dated* 20*th December,* 1850, *from* MAJOR P. W. WILLIS, *Engineer, Superintendent of the Grand Trunk Road, addressed to* CAPTAIN J. D. CUNNINGHAM, *Engineer, in charge of the Superintending Engineer's Office, N. W. P., Umballa.*

I will point out the principal data necessary for designing plans of works proper for a line of road, &c., such as are absolutely requisite to be registered before any correct estimate can be framed.

4.—To prepare and mature the data for the embanked road and drains, the levels of the line should be accurately taken; or if time should not admit of taking the levels of the whole line, at least levels must be taken of all dips, hollows, rivers, nullahs and valleys, jheels, undulations of ground along the line; and the highest known flood-marks should be drawn upon the sections. The number and nature of the designs for drains depend chiefly on the knowledge of the extent and depth of the highest floods; and it is impossible to provide for the drainage of an embanked road, without levels of the natural ground.

5.—As the line is to be made really an efficient one, as a commercial and military road of communication, the greatest care should be taken to determine with accuracy the exact amount of water-way and of raising required, and its liability to floods; so as to render the road passable at all periods of the year.

6.—I recommend your attentively considering the following points:—

1*stly*. The propriety of the choice of the ground for the new road.

2*ndly*. The proper height of the road, in respect of the water-line at the extreme of high floods.

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3rdly. The proper quantity of water-way for the necessary passage of the water through the said road, in the time of the said floods, so as to prevent its being overtopped and breached; bearing in mind that a road should never be too little or too much raised; that it is throwing away expensive metal to spread it upon a road liable to be under water at any time; whilst at the same time care should be taken that the embanked road shall overtop the extreme height of flood by only about 1 foot, or 1½ foot; the latter in sandy soils liable to great settlement.

4thly. Consider the particular places where arches ought to be situated, and the number and dimensions of the arches proper at each particular place.

5thly. Consider the best method of construction, and the form of the said arches, so that they may be done at as little expense as possible, consistent with their being effectual.

6thly. Carefully consider the proper section of the road, where it passes through ground liable to inundation from rivers overflowing their banks.

7thly. Consider the nature of the metal procurable; the distance of quarries from the road; the materials generally procurable for building purposes; and the rates for carriage, and laborers of all kinds.

8thly. Carefully consider the nature of the soils on which foundations are to be deposited, and the velocity of streams for which water-ways are to be provided.

7.—You must bear in mind that there are two most important requisites for a road: the one is *thorough drainage,* the other is *consolidation.* The latter desideratum is not to be attained without perfect drainage. Drainage was, before my supervision, too much neglected on the Trunk Road; and it is still neglected on most of the district roads under Local Committees. To provide sufficient drainage on the first construction of a road, would cost much less than

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the wear and tear occasioned by the want of it; and, indeed, without both evils being thoroughly provided against, no *labor* or *expense* will keep the road in a first-rate degree of perfection. No metalling ought to be considered as finished until thoroughly consolidated; that is, to a degree that will admit of horses in draught trotting over it without much extra exertion.

8.—It was after mature consideration of the above mentioned points, and after carefully taking the data for the designs and estimates for the work (now under construction) of the Grand Trunk prolongation between Delhi and Kurnaul, that we were enabled to submit at once the whole of the numerous estimates and plans for earth-work drains, bridges, and metalling, with sections or profiles of the ground, and of every nuddee and its valley, &c., for that line of road. I send you a list of the maps, plans, and estimates, connected with this line of road, extending about 75 miles, from the Lahore gate at Delhi to Kurnaul. I have inserted the amounts of each estimate, and the total estimated expense of every item (including large bridges) to complete the line in the most *permanent manner.* Thus I have fully answered your query as to the expense of a line of road *nearest* to your locality, though it is not quite a hundred miles, as you required.

9. The Grand Trunk between Delhi and Kurnaul will be a beautiful line of road, almost straight as an arrow, except where a slight curve of six miles is laid out on the railway principle, and not being perceptible to the eye of a traveller, is therefore of no consequence.

10. As to the standard width of surface of the Grand Trunk Road, I beg to say it is thirty feet at surface, with side slopes of four feet of base to one of height, except when above six feet.

P. W. WILLIS, MAJOR,
Supdt., Grand Trunk Road.

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No. II.—*Extract of Letter No.* 1053, *dated* 5*th November*, 1850, *from the* SUPERINTENDENT, GRAND TRUNK ROAD, *addressed to the* SECRETARY, MILITARY BOARD, CALCUTTA.

12. Now, as regards the maintenance of the road, I beg to submit the following observations, which describe and prove the efficiency of the measures adopted, and the principles which guide me, *viz.* :—

13. There are two most important requisites for a road; the one is thorough drainage, the other is consolidation. The latter desideratum cannot be attained without perfect drainage, which latter has been too much neglected; but to remedy the defect would cost much less than the wear and tear occasioned by its existence; and indeed without both evils being thoroughly provided against, no labor or expense will keep the road in a first-rate degree of perfection. No metalling ought to be considered as finished, until thoroughly consolidated; that is, to a degree that will admit of horses in draught.

14. The great advantage in maintaining roads in good condition, as a measure of economy, cannot be too often repeated, or too strongly enforced. A road in superior condition is assumed to be one that has always a hard and even surface, with curvature just sufficient to allow the water to run off, and at no time with extensive patches of the usual sized broken metal new laid upon it.

15. It is proved by the best practice in England and other countries, that it is good and economical policy to expend a considerable additional sum annually in improving and maintaining the road in a superior manner, if not to be effected without such extra expense. The ordinary course of proceeding is to lay down metal along a road just before it arrives at its minimum thickness, and at a sacrifice of some direct increase of expense upon the road, with a view to make some improvement. But the greatest

improvements may be made by a proper system, at very little, if any, increased outlay.

16. Now, to prove and establish such a position: on a thoroughly consolidated road, the wear is even, gradual, and very slow. The former usual mode of proceeding, and which is still too commonly the case in some divisions of the road, was to wait until the surface had lost its shape, and then a thick covering of metal, broken to the usual dimensions, was applied over extensive distances, and not sufficiently consolidated. This produces heavy draught, chance of injury to horses' feet, a very slow formation and consolidation, a great deal of displacement of material, and extra grinding and wear and tear. And these portions of the road are periodically rendered almost unfit for transit, and ultimately remain a misshapen fixing of not half the quantity laid down.

17. Now, the most perfect system has been obtained by a constant watching, and the application of very small patches of stone, broken fine, carefully supplied to the "small hollows as they shall successively be formed."

18. It is evident, that instead of all the grinding and crushing of the material, which attends the passage of wheels over a rough road, the friction and consequent wear on that which is perfectly even and hard, must be most trifling.

19. Under the system here recommended as best, and adopted on the Trunk Road, there will be, no doubt, some additional manual labor requisite on the road; but, at the same time, a most decided saving of material and in the carriage of it; and in places where the material is distant, the saving on that item will be greater than the expenditure on the other: thus obtaining an absolute deduction in outlay to procure the perfect road, and (what is of advantage in India) increased work for the laboring population, or the substitution of manual labor for the

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employment of material and animals. Under this thorough good system, the better the road is, the less will be the outlay upon it. This principle requires a different manner of proceeding from that of occasional working at intervals. It will require men on constant duty for every part of each division. In England, men have been employed on this principle called "mile-men," and with success. In France it is very general, if not universal; they are called "*cantonniers.*" On the Grand Trunk Road, we call them "*nowkur* coolies." Such men must reside close to the road, in huts erected at the expense of Government. When not actually employed in patching metal, there will be ample employment for these "*nowkur* coolies," in raising and trimming the kutcha sides and slopes, turfing, watering, preparing and breaking metal, &c.

20. It will be the duty of the Overseer to regulate the work for each gang of coolies. If a road that has four inches or more thickness of broken metal upon it is in bad condition, the proper process will be (not that ordinarily pursued, of immediately laying three or four inches of fresh material over its surface, but) to commence clearing dirt and dust off the hollows; then to make good the surface to an even and proper shape; pick up all the little hollows and ruts; fill them with metal broken fine; and have it well watered, and rammed down to the hollows.

21. The thickness of consolidated metal need never be more than eight inches, and should never be less than four or five. When reduced to that minimum, and provided its surface be good, it should be picked to the depth of half an inch, and about four or five inches of broken metal laid upon it, and well rolled or rammed; using artificial watering, if done in dry seasons; for, without watering, no metal will consolidate. The metal should be rolled or rammed. Rolling, for broken stone, gravel, and *khoah* is best; but kunkur metal is best consolidated by

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the rammer. The latter has been used with the greatest success for the kunkur in the Upper Provinces.

22. This coating of four or five inches will be the substance for regular wear, and, it is calculated, will last three years; small depressions, inequalities, or want of form, as soon as they can be perceived, being minutely corrected from time to time, by picking the surface, and then patching with small quantities of metal, broken fine, *watered*, and rammed down. Provided these principles be duly and properly carried out, the annual estimates will be required only for the provision necessary for quarrying, carriage, and stocking of metal; the "*nowkur* coolies" spreading and consolidating it.

23. I am of opinion that this system will preclude much petty peculation and fraud, which is scarcely to be checked on the method of working at intervals, on large estimates.

P. W. WILLIS, MAJOR,

Supdt., Grand Trunk Road.

No. III.—*Summary of Rules for working "Nowkur Coolies."*

I. The "*nowkur* coolies" are a permanent establishment, for making all the petty repairs to the surface of the metalled road, kutcha sides and slopes, mud walls, turfing, and tending trees.

II. The establishment is fixed on the following scale; which, however, is liable to modifications, as experience may hereafter point out. One *mohurrir* or native accountant for every Overseer's charge, or 50 miles, at Rs. 8 per month; one sirdar coolie for every 16·667 miles, at Rs. 6 per month; one mate-coolie for every 5·55 miles, at Rs. 4½ per month; ten coolies or "mile-men" in the dry seasons, and fifteen coolies in the rains, for every 5·55 miles, at Rs. 3 each per month.

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III. These coolies are to be furnished with tools at the expense of Government.

IV. Regular Monthly Returns of tools are to be sent to the Executive Officer's Office.

V. When tools are worn out, they are to be submitted to a Committee of Survey, and after being condemned, the unrepairable tools are to be sold by auction, and the proceeds brought to the credit of Government, in the Half-yearly Cash Accounts of the Executive Officers.

VI. When new tools are required, the Executive Officer is at liberty to get them made up, either by contract or otherwise, as may be cheapest; and after being submitted to a Committee of Survey, they can be charged for in the current Expense Bills, with proper vouchers attached.

VII. The coolies are to be furnished with huts at the expense of Government, excepting the walls, which must be built of mud by themselves, agreeably to the following dimensions; each hut is to consist of mud walls, two and a half feet thick, and eight feet high to eaves, outside; and to have gable ends at 25 degrees slope, for a tiled roof on a ridge pole. The internal measurement of each hut is to be thirty feet by ten in the clear; the rafters are to be of the commonest and cheapest kind procurable. Over the rafters, a bamboo frame is to be laid to carry the tiles.

VIII. The roofs of the coolies' huts will be constructed at the expense of Government, on regular estimates submitted by Executive Officers.

IX. The Overseers are to be held strictly responsible for the proper employment of the coolies, and are to submit to the Executive Officer weekly reports of how they have been employed, whether on metal, earth-work, mud walls, turfing, or tending trees.

X. The Overseer is to keep a long Roll or Descriptive Roll, of all the sirdars and mates; also an Acquittance

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Roll Book, with names of all employed coolies included, with their several stations noted.

XI. The coolie huts are to be 5·55 miles apart from each other, and their positions are to be so regulated that the huts shall be in the centre of each mate-coolie's charge.

XII. The key and charge of the nearest Overseer's chowkee is to be kept by the mate-coolie in charge of the nearest gang. This will obviate the necessity of hiring chowkeedars.

XIII. Executive Officers and Overseers are to adopt the strictest measures for the supervision of the sirdars, mates, and coolies. Every sirdar and mate-coolie is to be made responsible for the work of their respective gangs; and on the occurrence of the first fault or neglect they may be guilty of, their punishment should be instant dismissal; and the fact of their dismissal, with a copy of their Descriptive Roll, and nature of the fault for which they were dismissed, is to be made known, throughout the division and neighbouring divisions, so as to preclude their getting service under other Officers.

XIV. The perfect development of the "*nowkur coolie*" system, necessitates that the attention of sirdars, mates, and coolies, should be strictly confined to their prescribed duties. Executive Officers are therefore positively forbid to employ any one of the Road Establishment for the conveyance of letters or orders, however emergent; or in any manner whatsoever, except in their prescribed duties.

XV. Executive Officers and Overseers are empowered to collect two or more sections of coolies, for employment in any neighbouring section where urgent repairs—or where the road may have sustained great damage, and instant repairs—may be necessary; the men being bound to return to their particular station, as soon as the said urgent repairs have been completed.

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XVI. In reference to the above, and to the prescribed duties for the coolies, a Form of Voucher, for work actually done, is herewith annexed. This Voucher is to be attached to the Monthly Current Bills in which the wages of establishment are charged.

XVII. Every mate-coolie, after lining out and measuring the day's work for his gang, or a section, will make an inspection of one-half of his charge, 5·55 miles daily; every sirdar-coolie will make an inspection of his charge, 16·667 miles, at least twice a week; every Overseer will make an inspection of his charge, 50 miles, once during a month; and he will record his visits on a board hung in every chowkee, showing the dates of arrival and departure. These boards, or the paper from off them, are to be sent to the Executive Officer's Office for record at the expiration of every year; besdes which, the Overseer is to report his inspection in the usual Monthly Report of progress.

XVIII. Executive Officers and Overseers are to take care to instruct and see that every sirdar and mate-coolie understands how to line out and measure work; and that they are duly provided with ropes and iron pickets for lining out excavations, &c., and with proper measuring rods. Every mate-coolie is also to be furnished with an iron ring, 1¼ inches interior diameter; and he is to be instructed, that he will be liable to fine or dismissal, if he allows a piece of metal to be put upon the road, larger than can be passed through this guage.

XIX. As the State is put to great expense for metal for the Grand Trunk Road, it is indispensably necessary that no metal should be laid down without its having been properly stacked, measured, and reported on, for record in the Executive Officer's Office. Even for petty repairs this should be done. It may sometimes be impossible to procure a level piece of ground near the road, whereon to stack the metal in regular rectangular stacks, such as can be

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accurately measured; consequently, in such localities, it may be permitted to stack the metal on the kutcha side of the surface of the road; but under no other circumstances ought stacks of metal to occupy any portion of the surface—thirty feet of the road. Executive Officers and Overseers will be liable to severe animadversion, if they allow metal to be stacked on the kutcha sides, when there are other places adjoining the road whereon it might be stacked with advantage. The whole breadth (thirty feet) of the surface of the road, must be kept open for the convenience of traffic, and it is the particular duty of Executive Officers and Overseers to see that it is so kept.

P. W. WILLIS, MAJOR.

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No. 5.

MEMORANDUM REGARDING THE TRUNK ROAD.

By R. MONTGOMERY, ESQUIRE, *Magistrate and Collector of Cawnpore.*

THE better protection of travellers on the Grand Trunk Road, and an improvement in the mode of furnishing supplies to troops, have engaged much of my attention since I was attached to this district. I will here detail the state of things as they formerly existed, and the plans I have pursued in my endeavours to remedy them.

First, as regards the *protection of travellers,* I found there was no regular system of night-watch along the Trunk Road. At intervals of from three to five koss there were either thannahs or chowkees on the road-side, and at every three or four miles, there were *murhelahs,* or chowkeedaree stations. The thannah and chowkee *burkundâzes* had no night duties. The *murhelah* chowkeedars had orders to move about at night, which orders were more nominal than otherwise; and if the chowkeedar kept watch at his chowkee, it was as much as the generality of them ever did; and as I will show hereafter, the mere patrolling the road, even if carried out efficiently, could not have prevented the kind of thefts that took place. In addition to the above force, there were *sowars* stationed at every five koss, but these men were usually employed in carrying expresses, or escorting female dâk travellers, so that for general police purposes they were useless.

The large body of travellers and merchants with goods, put up for the night in the topes at the road-side. Some of them went to the *serais,* but the majority did not. The topes all along the road were filled with travellers, who, weary after their day's journey, slept soundly, and whose unprotected goods thus offered a tempting prize to the thieves who swarmed along the Trunk Road. From all

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I can learn the number of thefts which took place, and were never reported, were very great—most travellers preferring to put up with the loss, rather than suffer detention by the police, and separation from their party.

The stolen goods were quickly disposed of either in Cawnpore or Futtehgurh, where there are receiving-houses; or they were conveyed into Oude, within two hours after the theft was committed; which was rendered the more easy from the circumstance of the Trunk Road, to the extent of 62 miles within my district, bordering close upon the Oude territory, at an average distance of about 4 miles.

Robbery accompanied with violence was rare; indeed it was unnecessary. The thieves obtained their object better by stealth than by open violence, and there was less risk than in an open attack.

The plan I pursued has been in operation since February, 1846, and is as follows:—I offered merchants and travellers a safe asylum at night for themselves and their goods; for this purpose, I established halting-places at intervals of about three miles all along the road. The halting-place fixed upon was generally a good tope of trees, in the vicinity of water, and, where practicable, a bazar. At each station a strong watch was formed, whose special duty it was to patrol round the encampment at night. Travellers on entering the district were directed to these places, and warned not to put up elsewhere; I also engaged the zemindars in my favor, who co-operated with me, and I soon found that the halting-places were thronged of an evening, and that robberies were rare.

The *puraos* or halting-places are quite open, and there is no enclosure of any kind. The objection that persons in charge of merchandise have to *serais* is, that they are not opened till daylight, and thus they are unable to proceed early on their journey. The advantage of my plan is, that the travellers are quite unfettered as to the hour of

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departure. They may go and come as they choose, but so long as they remain, they are protected.

I caused huts to be erected at the different halting-places, for the watch to live in. One or more *burkundâzes*, with from one to three chowkeedars, were stationed at each place. The thannahdars visit them constantly, and the tehseeldars exercise a strict supervision over the whole arrangement, and keep me informed of all that goes on.

The arrangement would be much more effective, if I had *sowars* to patrol at night between the different halting-places, and I am still in hopes that the Government will supply them.

In 1845, the amount of property reported to have been stolen at night on the Trunk Road was valued at Rs. 2,350; in 1846, at Rs. 346-3-6. In my opinion, the majority of the thefts that took place in 1845 were never reported.

Robberies occasionally occur in military camps. The plan generally pursued by officers in command, is to station sentries all round, and exclude the police. The police can only be used therefore as a detective force, and often with little success, as many of the robberies are committed by camp followers, who are allowed to move off from the camp at a very early hour, before the police are even informed that a robbery has occurred, or before the theft is even known in the camp.

Secondly—As regards *supplies*, the resolution of the Vice-President in Council, dated 31st December, 1830, tended much towards remedying the abuses which existed previous to that period. *Talls* for the supply of firewood, earthen-pots, &c., &c., have been almost universally adopted along the great lines of communication, and I believe generally answer well. Occasionally, where the officer in command of troops is lax in discipline, or where there is no European officer, wood is plundered, or only paid for in part; but this is rare, and becoming more so every day.

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Indeed, within a very few years a great advance has been made; grass, *kunda*, milk, &c., being readily brought by the villagers into camp for sale, a thing which was formerly unknown.

The sufferers at present are the bunneeahs, whose business it is to supply grain, atta, &c. Till I examined the matter minutely I had no conception of the loss they sustained, and their reluctance to sell is not to be wondered at. In addition to their actual loss in money, (which I will show hereafter to be considerable,) they have to leave their families often for two and three days together, which subjects them to inconvenience, and sometimes obliges them to close their shops.

I here give a statement which will show the actual loss incurred by the bunneeahs in furnishing supplies to regiments and detachments, at three different stations in this district, during the last few months. I have particularized the detachments, and the dates on which the supplies were furnished. These have been selected as examples from many that I have had prepared, and are a fair average of all the rest.

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Date of *purwana*.	No. of Regiment.	Date on which the articles were supplied.	Quantity of grain, &c., mentioned in the *purwana*.	Quantity of grain, &c., sold.	Price of the grain.	Loss sustained by Bunneeahs.		Remarks.
			Maunds.	Maunds.	Rs. As. P.		Rs. A. P.	
24th February, 1847.	Detachment H. M. 3rd Dns.	26th Feby., 1847, Maharajpore,	110 0 0	60 0 0	95 0 0	Conveyance hire of grain to the encamping ground, ...	5 2 6	The cost of carriage will of course vary in proportion to the distance the grain is carried to the station.
						Dustooree to kotwal and chowdrees,	1 7 9	
						Fees of weigh-men, ...	1 7 9	
						Return hire of 50 maunds sent to the camp, but not taken, ...	2 5 6	
							10 7 6	
26th December, 1846.	Remounts,	8th January, 1847, Kulleanpore,	84 20 0	39 20 0	70 0 0	Cost of taking the atta, &c., at half anna per maund, the distance being 3¼ miles, ...	4 3 0	
						Dustooree paid to the chowdree of the Regimental bazar, at ½ anna per rupee on the quantity sold,	2 3 0	
						Weigh-man, at ½ anna per maund,	1 4 0	
						Return hire of 95 maunds, ...	2 15 6	
							10 9 6	
18th January, 1847,	24th Regt. N. I.,	20th January, 1847, Urwul,	108 29 0	64 17 6	67 15 9	Cost of taking the grain, at 4½ pie per maund, ...	2 0 3	
						Dustooree paid to the kotwal and chowdree, at 3 pie per rupee,..	1 1 0	
						Weigh-man, at 2½ pie per rupee,	0 8 6	
						Return hire of maunds 69-11-6,...	1 6 3	
							5 0 0	

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Eight rupees may be taken as the average loss incurred by the bunneeahs at each halting-place, and reckoning six such places in this district, the bunneeahs incur a loss of 48 rupees for every regiment or large detachment that passes through the district.

The sum fixed as *dustooree* for the kotwal and chowdree of the bazar, and also for the weigh-man, varies from 3 pie to ½ an anna; and generally speaking, in addition to this, a *nuzzur* of one rupee is presented to the chowdree by the bunneeahs, for the purpose of expediting matters, and making all go smoothly. As this is not a fixed charge, I have omitted it in my calculation.

The order to furnish supplies for a regiment is a matter of rejoicing to the *mirduahs*, whose duty it is to procure them. A *douceur* given to them will generally purchase exemption from attendance, and save both loss and trouble. Bunneeahs often have to come from a distance of six and seven koss and furnish their quota of supplies. If they complain, the reply is, that it would be unfair always to press those close to the road.

Some will say, "why not fix a rate on the grain which will remunerate the bunneeahs for all losses?" This is not so easily calculated beforehand, and unless carried out in all districts, would not answer. Suppose it done in my district, and not in the neighbouring one, the sudden high rate (for there is nothing that native soldiers are more alive to than the *nirukh)* would assuredly be visited on the heads of the grain-sellers, if not on the chuprassees in attendance, who knowing this so well, generally contrive to fix a more favorable rate for grain sold in the camp, than that in the neighbouring bazar: this too in the face of positive orders from the Collectors to the contrary. My own office, and that I doubt not of every other Collector can furnish similar orders, and I doubt whether in any of them they are acted up to.

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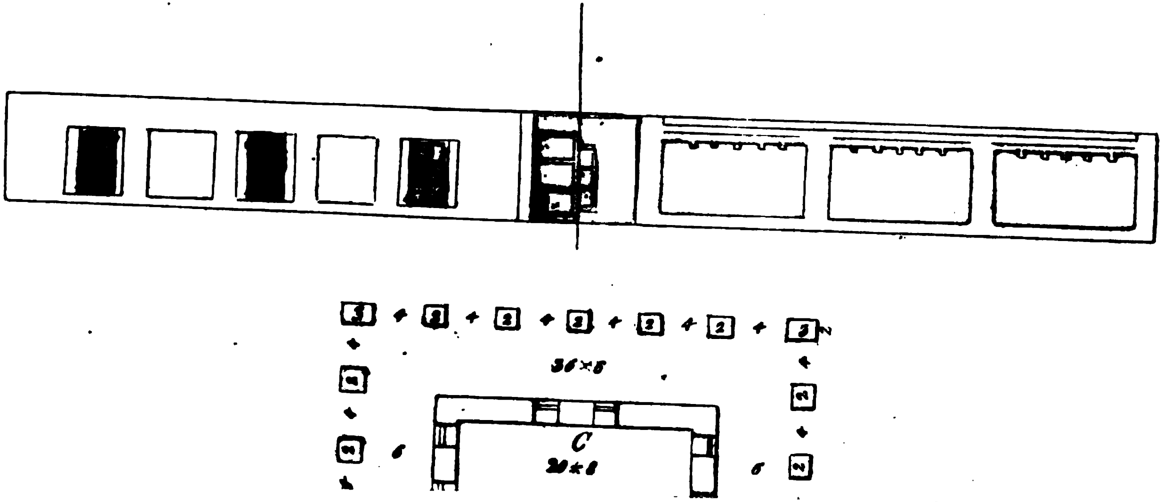
The Government has lately issued orders for the formation of encamping grounds along the Trunk Road. They will be found most useful, and should be made as complete as possible. With the sanction of the Road Committee, I have had *burdasht khanas*, or places for storing supplies, formed on each encamping ground, of which I send a plan. The *burdasht khana* consists of an enclosure of 94 feet by 59, with a strong gateway. There are houses inside for storing supplies of wood, earthen pots, *bhoosa*, &c., &c., which I have made over to the contractors who supply them. In the front is a row of six bunneeah's shops, which were built in the hope of inducing bunneeahs to inhabit them, and furnish supplies of grain. A small room has been added to the rear of the building, with six windows, 2½ by 2, to be closed when not required, and through which the supplies will be served out.

These *burdasht khanas* have been built close to the edge of the road, and an inducement held out to bunneeahs to occupy them, with the prospect of having a constant demand for their grain from passing travellers. I also made a small advance, for the repayment of which they have given good security. I have now succeeded in obtaining bunneeahs for all the shops along the whole line of road, they agreeing to furnish supplies to all regiments, at one seer per rupee less than the market rate of atta in the neighbouring bazar. This, whilst it is a very profitable arrangement to the bunneeah, can hardly be considered unfair towards the soldier, who, if he can purchase it cheaper elsewhere, is at liberty to do so. I have no doubt, but in time, grain will be sold to troops at the same rate as to others; but at present some arrangement seems absolutely necessary, to check the gross abuses of the prevailing system.

On the arrival of each regiment, the tehseeldar having learned the rate at which grain is sold in the bazar, will

Half Elevation, half Section and Plan of Burdasht-khanah

in the Cawnpore District.



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determine the rate for the camp in the manner above noted; and having signed it, will furnish the officer in charge of the bazar with a copy, and transmit another to the station, for record.

I should state that I have procured contractors at each halting-place to furnish the supplies noted in the margin. Small advances have been made, on their furnishing substantial security for the repayment of the amount.

Milk, butter, *dahee* (or curdled milk) mutton, lambs, kids, *bhoosa*, fowls, chickens, eggs, straw, grass, earthen-pots, mallets, tent-pins, *kurbee*, fuel, and charcoal.

R. MONTGOMERY,

Collector and Magistrate.

Cawnpore, 17th April, 1847.

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No. 6.

ROAD-MAKING IN THE HILLS.

No. I.—PRINCIPLES LAID DOWN BY MAJOR J. P. KENNEDY, FOR THE GUIDANCE OF ALL PERSONS ENGAGED IN CONSTRUCTING THE ROAD FROM KALKA THROUGH SIMLA, TO KUNAWUR AND THIBET.

Every road should have its line as level, and its surface as hard, smooth, and non-elastic, as circumstances under the most scientific management will allow.

The subject of road-making may be divided into two general branches :—

First,—The laying out of the line.

Second,—The construction of the road.

LAYING OUT OF THE LINE.

When the grave charge of initiating the improvement of a district of country, by the construction of roads, is committed to a man of judgment, his first care will be to consider the features of the country, not only within his immediate charge, but far beyond those limits.

He should divide his road projects into three distinct classes:—the first and most important containing the lines of general intercourse; the second containing the roads for merely local objects, and communicating with those of the first class; and the third containing the farm-roads communicating with those of the second and first. He should not, upon any account, permit the perfection of his roads of the first class to be in the slightest degree injured for the benefit of those of the second or third classes. His great lines of intercourse must be laid out solely with reference to the general levels of the country, and to the permanent markets, to which producers may afterwards have to convey their goods. If he think only of his own little district at this point of his operations, he will materi-

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ally injure it, as in that case his general lines will probably not be such as to invite general traffic, and the mercantile interests of his district will be proportionally impeded. The co-operation of the circumjacent neighbourhood is essential to the improvement of any given spot of country, and must be earnestly sought for. Keeping these considerations constantly in view, we may now proceed to the rules applicable to all branches of laying out, *viz* :—

1st,—That the line must never rise or fall unnecessarily; it must go round, or cut through impediments.

2nd,—That the quantity of ascent or descent, when such is unavoidable, should be divided uniformly over as long a distance of the line as the nature of the ground will permit, and thus the inclination at each particular part will be reduced to the smallest possible rate.

We should recollect that the loads carried along roads must be small in proportion as the inclination of the hills is great; that the steepest hill, in fact, regulates the load.

We must never forget, in laying out a line of road, that on an inclined plane or hill, of which the surface is hard and smooth, when any power holds a heavy body in equilibrium, the power exerted will have the same proportion to the weight as the height of the plane or hill bears to its length; and secondly, that whilst the effect of the load increases, the power of the animal employed to draw it diminishes in proportion as the degree of inclination increases. These two facts should never be absent from the road-maker's mind.

When this subject is fully understood, it will be evident that the ignorance of a person who undertakes to lay out a road may, and very often does, make the transport of commodities amount to many times what it should cost. There is little doubt that the greater number of the hills we generally find on roads might have been either wholly avoided, or their inclination very much diminished, by

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judicious laying-out; and the greatest evil is, that the only wise remedy for such blunders is to make a new piece of road where they exist, and if they are numerous, to change the entire line. The common mode of correction is to cut down in some degree the hill, and to fill up a little the hollow; but this method rarely reduces the inclination as low as the natural features of the ground would allow; and it generally costs much more than would be necessary to put the road in its right place by laying it out afresh.

The correction of hills on old roads has been alluded to here, to show the importance of extreme accuracy and sound principles in selecting an original line. Every Superintendent will now understand that if an error be made, it cannot be thoroughly remedied without abandoning that portion of the road where it exists, and taking up a new line, thereby losing the capital already invested, and injuring the speculators whom the road may have brought there; but if there be an error of construction, as for instance, the use of soft materials instead of hard, or the like, all this can be set right without abandoning the old line. The power of getting level roads by cutting through hills and filling up hollows is not disputed; and in laying out a line of railroad this method must be adopted, because the velocity of the steam-carriage will not allow of such rapid curves as a road must take which follows the natural inflections of our hills; but the expense of such cuttings and embankments is so enormous, that to think of them for the ordinary roads would be quite out of the question. Our necessities frequently require that farm roads should be made; that roads for approaching minor villages, &c., should be made; and that extensive districts of almost unexplored countries should be intersected by numerous lines of general communication. If a costly kind of road be attempted in such cases, the necessary results cannot possibly be produced, because the necessary funds could

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not be provided; still it is essential that as accurate a regard should be paid to their laying-out, as if they were to be immediately constructed on the most perfect models, and that the levels be the very best that the nature of the country will admit of. We must provide from the commencement that every successive operation shall tend to bring them ultimately to a state of the very highest perfection, and that nothing shall ever have to be undone.

False ideas of economy and inadvertence frequently lead to the employment of men who do not understand the principles of these essential operations, although they attempt to execute them, and hence the eternal toiling up and down hill to which they, their neighbours, the public, and future generations are condemned. Most amateur artists are time-killers and money-wasters; but of all the amateurs in the world, the road-maker is the most mischievous: there is no method of avoiding his ingenious contrivances to harass the weary traveller and reduce the profits of industry.

The first thing to be done, when it is determined to open a road between any two points, if they be distant, is to get the maps of the adjacent country, and to become thoroughly acquainted with every inch of the intervening ground in all directions, particularly the course of rivers.

If it be a hilly country, the greatest possible attention must be given to choose the most convenient passes of mountains with reference to their height, and the highest passes of valleys, which in all cases, must be considered as obligatory points of the line. The selection of these, therefore, is to be considered the first and most important point of laying-out, and nothing short of *mathematical proof* of their superiority to all other points ought to satisfy the Superintendent that he has selected the right points.

It is much to be regretted that the Survey Department of India has not furnished the public with that most impor-

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tant class of information, a contour delineation of the hills; the want of which must be remedied by increased industry in all those who are engaged examining the country, with a view to the selection of the line.

The most disadvantageous circumstances under which it can be required to lay out a line of road is, where the direction runs at right angles across a line of hills, to the passes of which there are no convenient approaches by means of under features; this obliges us to resort to the expedient of zig-zags. There is no difficulty in laying out such a road to any required degree of inclination; but when done, it is always dangerous, as it is not possible to avoid very acute angles, which, on a declivity, are most objectionable. If an animal run away with a carriage in descending such a road, the first turn he reaches will probably finish the mortal career of the whole party.

The rule in such a case must be, to make as few turns as possible; and in general, there need not be more than one on each side of the mountain.

Having obtained a knowledge of the relative heights, as above described, both from maps, and by taking lines of section with the level, and having thus selected all obligatory points, we may now proceed to the operation of marking out the exact line between all the points thus selected. This is done by fixing up pickets, with flags attached, in the required slope, by means of either the plummet level or a spirit-level, having a graduated vertical limb. These flag-pickets may be placed at intervals of about one hundred yards, more or less, according to the bends in the hills, taking care that one is put at every projecting and every retiring angle of the ground, and that from each picket the one on either side is distinctly visible. We proceed thus until the whole line is picketed off, observing to correct this line, if requisite; and it rarely happens that the pickets can be placed precisely in their right permanent position at the first trial.

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Having got the long pickets accurately placed, the ground should be distinctly marked at each picket by cutting a cross, or some other convenient sign; and the second operation must be commenced by placing short pickets, with the boning rods at intervals of about eight yards, between the long pickets.

Third operation. Having placed the short pickets, long lines are then laid to the foot of the pickets, taking care that the lines run round all obstacles, and not over them. When these lines are fixed, some expert laborers, accustomed to the work, may be placed to cut out the lock-spitting exactly to the level of the line.

This operation should be done with great accuracy, that there may be no necessity for correction afterwards; and handy men, accustomed to the work, should be employed in lifting the lines and laying them again, as the lock-spit cutters proceed. This lock-spitted line being the sole regulator of the levels, must be examined, and re-examined, to ascertain that in every part it has been accurately cut. The person charged with such a work must not spare himself at this point upon any account. Let him then bring every one whose opinion is worth having in the neighbourhood, to visit and criticise what he has done; let him reflect, that by any idleness or stupidity on his part, he passes sentence upon countless generations to suffer inconvenience and unnecessary toil for his omissions. The lock-spitted line, when completed, is not to be considered as anything but a gauge for the general level of the surface of the road. It is not the centre, as some suppose; although, upon a general principle, the nearer the centre line comes to it, the cheaper will be the forming of the road; and the more we diverge from it, the more costly it will be, where the features of the country are of a hilly character.

With the completion of the above described lock-spitted mark, neatly cut along the whole length of the projected

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road, we shall consider the business of laying out the line to have been executed; and in order the more clearly to separate this most important operation from all others, we shall consider the subsequent picketing, ruttings, and marking off the details, as appertaining to the subject of construction.

The average cost of cutting this gauge line or lock-spit, independent of the preparatory surveying and superintendence, ought not to exceed four or five shillings per statute mile—that is to say, for the actual pay of the laborers employed to execute it; and when completed, it ought to exhibit a perfect level or a perfectly uniform incline, between every two of the obligatory or main points, and following every horizontal inflexion of the ground; it ought to stand the test of any instrument, and be pleasing to the eye. The want of accuracy in the laying-out of public undertakings, is the source of that constant doing and undoing, or playing at blindman's buff with the work, which we so often see; doubling or quadrupling the proper cost, and leaving most discreditable results. The economy and perfection of the work will be in proportion to the judgment and accuracy applied in the laying-out and making of this gauge-line, as it gives us the key by which to regulate with the utmost precision every subsequent effort of every laborer we employ; and to point out where every spadeful of excavation is to be dug, and permanently deposited, with the smallest amount of exertion. We shall next proceed to the subject of

CONSTRUCTION.

As soon as the lock-spitted gauge-line shall have been well considered and criticised, and all necessary corrections completed, it may be widened into a 5 feet track. The next operation is to fix the pickets for the centre of the road.

This will regulate—first, the cost; and second, the appearance of the work when complete. We must avoid objec-

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tionably sharp turns; but we must also studiously avoid heavy cuttings and fillings, and we must make our curves regular. These three points can generally be combined; and they must be combined, otherwise the Superintendent cannot be qualified for his charge. He should never have his eye off the gauge-line; and as each picket is placed, it should be accompanied with a mental calculation as to the quantity of cutting and filling, and consequent cost it will require to bring the road at that point to its proper width, and to the level of the gauge or lock-spit. He will bear in mind that as often as he can place a picket exactly at the lock-spit, without infringing on a principle, he should do so, as then the forming of the road will cost the least possible sum; unless when he has to deal with rock which requires blasting. He must at all times think of his finances, taking care that the amount of money or labor estimated for the work shall be made to complete it; and he will be justly culpable if it fall short, as this consequence is very rarely attributable to any other cause than unfitness in the Superintendent. The wrong placing of a few pickets may cause a piece of work to cost double or tenfold—nay, a hundred times more than it should cost; and it is clear that the man who can perform the most perfect work at the cheapest rate, must at all times earn character in proportion. It is evident that there may be a very great variety of curves made for rounding off the angle which the lock-spitted gauge-line forms in passing a valley or ravine, and that the more the curve is carried out from the angle, the better will be that particular part of the road; but it must be recollected that the slight improvement thus effected on one spot, is attended with most disproportionate cost; and, if a man deficient in judgment be placed in direction of such works, he may use very fine arguments as to the utility of gradual curves, and the like, but the result will be, that instead of succeeding in fulfilling the object of his employer, by opening in its full length a

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useful line of intercourse, he will find all his money expended on two or three fantastical embankments. He will leave the district as closely sealed up as he found it, and his employer will be justly disgusted with such costly enterprises. If he desire to serve himself, and to be useful to his neighbours, he will follow, as nearly as possible, the natural features of the ground; unless when there is the most indisputable reason against this; and keeping a watchful eye upon the money-chest, he will never sacrifice the general result to any chimera whatever. This cutting and banking mania is the grand source of wasteful expenditure in the construction of our roads.

If, instead of going uniformly along the side of a hill, and making our road with the minimum of cutting and filling,—if, instead of this, we seek to torture it into straight lines, still keeping to certain predetermined levels, the line of road must be a succession of deep cuttings and high embankments: costly at first, and costly to the last, from their liability to dilapidation.

As soon as the centre line shall have been cautiously picketed out, all the side lines must be measured from it, and distinctly rutted out upon the ground, taking care to lift the several shear-sods. These lines will show the verges of the road; the inside and outside of the fences, when such are made on the road; and the width of the water-tables, as well as the position of the catch-water drains. Accurate *bonings* must be put in at every picket in the centre line, which will thus be level with the opposite points of the lock-spit gauge, and a correct longitudinal section must be made up between these pickets.

Cross section lines should likewise be made up to the intended level of the road, at every 100 yards, showing the precise fall that the road is to have from the centre to each side, when formed. But in making up longitudinal and transverse sections, it is necessary to observe

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whether the soil be of such a nature as to answer for the soling, or whether it be of so defective a quality as to require a superstratum to prepare it to receive the broken stones or surface gravel; and a corresponding distinction should be made as to the height to which the section lines should be raised in different places. If the natural soil be of the right quality for soling a road, it would be an unpardonable waste to require that more of the same description of material should be excavated elsewhere, and brought upon it, although we have known such surprising extravagance set forth in Specifications. The cross-slope given to a road should vary according to circumstances. If its maintenance and repair be carefully provided for, on level ground, a fall of one in twenty-four from the centre of the sides will be sufficient. If there be any doubt as to the future care, the best precaution is, to increase the cross-slope as a security against surface-water; and in all cases it is well to make the cross-slope somewhat greater on declivities than on the level ground, in order that the path of all surface-waters may be directed in the shortest lines to the water-tables: under these different circumstances, the cross-slopes may be made to vary from one in twenty-four to one in twelve, and they should be accurately proved by the section level.

It is well to know that some authorities on this subject have recommended the cross-slope of roads on declivities to run the whole way from the outside verge to the inside; whilst others advise just the reverse, and not from the centre to each side. The chief object of the first recommendation is, to prevent the corrosion of the outside verge by the surface-water: and that of the second to prevent any accumulation of water in the water-tables: but they both appear to be most objectionable in practice, as they necessarily throw every carriage off its level, and bring an unequal portion of the load on the wheels of one side. They also give a longer run to the surface-waters on the

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road. No professional man should permit so serious an inconvenience to be inflicted on the public. His ingenuity ought to provide a remedy of a different kind. As soon as the longitudinal and cross sections have been made up to the right level, the work may be considered in a state to employ large forming parties, who after this preparation, can scarcely commit errors, if there be any degree of activity in the Overseers.

When the road is constructed upon level ground, it is desirable to make two side fences with water-tables outside of these; when it is on sloping ground, one side fence will suffice; the cut face of the bank forms the other.

It is evident, that on sloping ground, the Superintendent who desires to execute his work with economy, must use every exertion to provide that the quantity of cutting shall, as nearly as possible, agree with the amount required for filling, that he may not be obliged to carry materials either to or from the place where he works.

The materials used for fences, retaining embankments, &c., will depend upon the nature of the soil, in a great measure; and the best proof of skill, in this or any other art, is the power of making the most possible out of the circumstances in which we are placed. The man who cannot supply himself from his own vicinity, would fail, if he had Guernsey granite aud mines of gold at every perch of his progress. When the soil is stony, the fences and faces of embankments would naturally be made of this material; and, when built dry, they should have a slope of one-fourth of their height. If sod work be used, the slope should be increased to one-third of the height; and when a bank of earth or other material is faced without being supported, the slope will depend on the quality of the soil, observing to give the greatest slope to the most friable soil; and it is for the Superintendent to observe the natural slope at which each kind of earth will continue. The best

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soil that we can meet with in constructing roads is gravel; because, in the first place, it has natural drainage; secondly, when the road has been formed in such a soil, it is both soled and metalled, unless the traffic be of a very heavy description.

In making a road through any spongy or soft soil, it is well to let the work season, after the general drainage and forming have been effected, before proceeding further. When embankmentts are filled up, a considerable allowance must be made for sinking; and after allowing them to season, they should be again levelled up. If these points be not attended to, or if the work be hurried over, it will look well at first; but afterwards, it will show many inequalities and defects that might have been avoided.

The liberal use of a heavy roller is an excellent way of consolidating the surface of a new road, preparatory to opening it to the public; and the difference in the quality of both gravel and stones should be well understood by every road Superintendent. Some stones can be broken with more profit to the workmen at one anna per ton, than others at six annas; and where heavy carriages are in use, the low priced stone is in general the more costly in the end. We must recollect that the price of breaking the stone forms but a portion of the cost of metalling a road; and the most durable material to be had within any rational limit as to cost, is at all times the most desirable. Contracts for stoning, therefore, should always specify the precise kind of stones required, and from what quarries they are to be taken; and no one can be considered properly qualified for superintending such works as we are now considering, unless he have acquired a thorough knowledge of the several varieties of rock common in the country, with the different qualities and properties peculiar to each.

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When we estimate the cost of a new road, we should divide the whole into three very distinct general heads. The first may include all the expenses of surveying, laying-out, forming, draining, fencing, soling, gravelling, and all else preparatory for the stoning. The second head should show the cost of the stoning or metalling, and should detail minutely the quality of the stones required, and the quantity per perch; allowing a larger dimension to the broken stones in the bottom, and a small dimension at the surface. The third—the cost of the masonry, bridges, pipes, and tunnels, if any.

It is extremely essential to separate thus the great heads of expense, in order to enable *all persons* to understand the way in which the total cost is made up on different descriptions of work; and, as it were, to get rid of that professional mystery which is generally made to envelope everything relating to the expenditure of money.

The details here included under the first head are such as are required, with but little variety as to their application, in all projects for new roads; and their cost may be made to vary from Rs. 100 to Rs. 600 a mile, according to the peculiarities of soil in which we are working. The second head, or metalling, may be either wholly omitted in certain cases, or it may be adopted to any degree that the circumstances render necessary. For instance, three tons of tender stone, at one or two annas a ton, may be thought applicable for the exigencies of one case, when in another it might be indispensable to apply twelve tons to the perch, of the hardest stone to be had, at a cost of perhaps six or eight annas per ton; thus making the rate for this branch of cost vary from three or four annas, to 100 annas the perch, according to the means applicable for the construction, and the intensity of the traffic to be expected. The third general head, including pipes and masonry, is also capable of being effected in

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various degrees of excellence, and at proportional rates of cost, which can only be regulated by comparing the necessity of the work with the funds applicable for its construction.

J. P. KENNEDY, MAJOR.

SIMLA: }
June 15th, 1850. }

NO. II.—HINDOOSTAN AND THIBET ROAD.

Rules for Superintendents, Overseers, &c., &c.

Officers employed on the survey of the line are to send in reports of their observations, at least once a week, addressed to Major Kennedy, at Simla: these reports to be accompanied by sketch plans and sections. The plans to be on a scale of two inches to one mile. The section horizontal scale to be likewise two inches to one mile, and the vertical section 200 feet to one inch.

2.—The maximum incline is not to exceed 3 in 100, or 1 in 33⅓; and every exertion must be made to keep the inclines as much as possible *below* this maximum.

3.—The whole line is divided into Superintendent's divisions, and each division to be designated by a letter.

4.—The point from which all measurements are to be taken is marked by a picket sunk opposite Mr. Vivian's house, in the Simla bazar.

5.—The 1st division, commencing southward, is denominated the A., or Krole division; the 2nd B., or Simla division; the 3rd C., or Mahassoo division; the 4th D., or Mutteeana division; the 5th E., or Kotegurh division; the 6th F., or Teranda division; the 7th G., or Chini division; and so on to the end of the line northward.

6.—All reports to be made on foolscap paper, and marked at the head of the report with the divisional letter

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to which the portion of the line it refers belongs, as well as the territory. It will be folded in four, and docketed on the back by the Officer who sends it, with the divisional letter and the substance of the report.

7.—All Officers will be expected to keep copies of their reports, plans, and sections, for the convenience of future reference.

8.—All Officers employed in surveying the line, as well as Officers in charge of divisions, and Overseers in charge of sections, and also Assistant Overseers, will be required to make themselves thoroughly acquainted with the printed paper containing the "Principles of laying-out and constructing the works," that a uniform practice may obtain throughout.

9.—The working parties are to be kept under the superintendence of their respective mates; and each Sapper Overseer is to be appointed to his distinct and separate charge, consisting of one or more mate's parties, according to the strength of the whole party, as shown in the following table :—

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Composition of an Overseer's party for working a section of 10 miles of the line. { *Two or more Overseer's sections to constitute a superintending Officer's district.*

Sappers.		Mates and Laborers.											
Overseer in charge of Section.	Assistants in charge of sub-Section.	When Working single force.		Double force.		Triple force.		Quadruple force.		Quintruple force.		Sextruple force.	
		Mates.	Laborers.	Mates.	Laborers.	Mates.	Laborers.	Mates.	Laborers.	Mates.	Laborers.	Mates.	Laborers.
1	1	1	50	1 1	50 50	1 1 1	50 50 50	1 1 1 1	50 50 50 50	1 1 1 1 1	50 50 50 50 50	1 1 1 1 1 1	50 50 50 50 50 50
	1	1	50	1 1	50 50	1 1 1	50 50 50	1 1 1 1	50 50 50 50	1 1 1 1 1	50 50 50 50 50	1 1 1 1 1 1	50 50 50 50 50 50
	1	1	50	1 1	50 50	1 1 1	50 50 50	1 1 1 1	50 50 50 50	1 1 1 1 1	50 50 50 50 50	1 1 1 1 1 1	50 50 50 50 50 50
	1	1	50	1 1	50 50	1 1 1	50 50 50	1 1 1 1	50 50 50 50	1 1 1 1 1	50 50 50 50 50	1 1 1 1 1 1	50 50 50 50 50 50
	1	4	200	8	400	12	600	16	800	20	1000	24	1200

Remarks.

This composition of the working-parties will enable one Sapper Company to furnish Overseers for ten Divisions, extending over about 200 miles. It gives us the power to employ efficiently under them from 2,000 to 12,000 men a day.

Until the line is opened to 6 feet wide, the pickets showing each man's working ground must be placed, when working in clay or gravel, at seven yards apart; and in rock, at two yards apart.

A party working in *double* force would thus cover upwards of 1¼ mile in clay, or about ½ mile in rock work, and it is probable that the double force would in the first operation be better looked after than a more extensive party. Working our 10 divisions at double force would give us 4,000 laborers. When the widening of the road to its full extent commences wall building, &c., then the larger forces may be called in with profit.

One of the Assistant Overseers should always be a miner.

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10.—During the rainy season the working hours must depend upon the weather, the Overseers using their discretion as to the hours for meals. When the weather, however, is fine, every party must be at work at 6 o'clock, A. M.; the dinner hours to be from 11 till 1; and to leave off work at 6 P. M.

11.—As much waste of time occurs in mustering large parties of laborers, when this is not done with care, the Overseers are required to put the men at once to work under their respective mates, at the established hour for commencing. The chief Overseer will then immediately go round and muster each mate's party separately, noticing the absentees. Thus, only one mate's party at a time will be diverted from work for this object.

12.—A daily report in the following form will be sent from each party, showing the number of those present, and the quantity of work done during the day, as well as the total number of days' work from the commencement, and the total work done in the section.

Section *Division Road Report,* *day of* 1850.
(*Territory of*)

	Sergeants.	Corporals.	Native Officers.	Native Non-commissioned Officers.	Sepoys.	Mates.	Coolies.	Total.	*Road opened in yards.* Lockspitted.	To 5 feet.	Road completed.	Remarks.
Total brought forward from commencement of work, On day of 1850,												
Total, ...												

Examined,————— —————

In charge of Division. *Overseer in charge of Section.*

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These reports will show the mileage cost in labor at which each Overseer is performing his work, and will afford a good comparative scale of the value of each Overseer; and the names of those whose efforts prove them to be most deserving will be forwarded for the favorable consideration of Government.

13.—Before the parties are dismissed in the evening, every mate must be informed of the precise point where his squad is to assemble on the following morning.

The distribution of the men, by assigning to each a regular portion of work, marked off by pickets, and sufficient to occupy him for the day, is the most important duty of the Overseer and his Assistants. By this method a fair principle of task-work can be established; and there is no other remedy against idleness, and consequent waste of the public resources. The omission of this practice frequently makes public works cost from ten to twenty times the proper amount; and every Superintendent and Overseer employed in the present works will be held strictly responsible for the execution of this essential rule.

14.—The breaking of tools is entirely attributable to the carelessness of the Superintendents and Overseers, by allowing the weaker tools to be applied to the work of stronger ones. The pickaxe and the hoe are frequently destroyed by attempting to remove heavy stones with them; a labor which ought to be reserved for the crowbar, the sledge, and wedge.

15.—The present deficiency of crowbars, sledges, mining tools, &c., will gradually be remedied. In the meantime, Overseers must employ the weak tools at the clay and gravelly portions of the work, where, after a 5-feet track has been completed, with convenient passing places 12 feet wide, the width of the road may then be generally increased to 12 feet, with passing places of 18 feet wide,

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at salient and re-entering angles of the ground, and at other convenient places.

16.—The ultimate width of the road may be considered at 18 feet throughout, with the exception of difficult cliffs, where the width of 12 feet will suffice. In every part of the road a retaining wall, on the side of the precipice, will be requisite to completion, with a parapet raised 2 feet, 3 inches, above the road level. Small weep holes, 4 inches square, to be constructed under the parapet, for the escape of the surface-water, at every 50 feet.

17.—At every re-entering angle of the ground, and at distances not exceeding 100 yards, substantial cross-drains must be made under the road, of ample dimensions, to carry off all the water that can be expected in the heaviest rains; and in no case, are these drains to be of smaller dimensions than 4 feet high on the outside, and 2 feet wide, which is sufficient to admit a man to clean or repair them.

18.—Great care must be taken in preparing sound foundations for all walls which, when built dry, as retaining walls on the outside or precipice, should have a slope of one-fourth of their height, and a thickness at their foundation not less than one-fourth of the height, *plus* two feet six inches. These retaining walls it is not desirable to make generally more than 4 feet high, exclusive of parapets, although many emergencies will render much higher walls occasionally requisite.

19.—In opening the first 5-feet track, where very difficult cliffs occur in the line, temporary tracks may be made either above or below the proper level, as the nature of the case may permit, taking care, after passing the obstacle, immediately to regain the proper level. By this means an immediate passage can be obtained long before the permanent passage could be made in its proper position. And it is desirable that such temporary passages

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should be above rather than below the proper level; because, in that case, the progress of the permanent track in its proper position along the cliff, will not be impeded by persons passing on the temporary track. These temporary tracks should be suitable for the passage of mules; and they may, in many cases, be made to occupy either the brow of the cliff, which shall ultimately be worked down to the road level, or the foundation of a wall, to be subsequently built up to that level.

SIMLA:
June 15*th*, 1850.

J. P. KENNEDY.

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No. 7.

COWREE-RAM BUND, AND ROADS IN GORUCKPORE.

No. I.—*Letter from* H. C. Tucker, Esq., C.S., *Secretary to the Road Fund Committee of Goruckpore, dated 22nd January, 1850, and addressd to* E. A. Reade, Esq., C.S., *Commissioner of the Benares Division.*

Sir,

In obedience to the verbal orders of the Lieutenant-Governor, given on Friday last, in camp at Babutpore, Zillah Benares, I have the honor to submit a brief report on the Cowree-Ram Bund. As I leave the district to-morrow, the plans, though correctly done, are not as neat as they might be; and the report, in the bustle of making over charge of the zillah, is necessarily hurried. In truth, I had hoped to have escaped the necessity of writing a report at all; as I would at any time rather do a thing, than write about it when done.

2.—The city of Goruckpore is cut off from Azimgurh and the districts lying beyond, by the valley of the Amee, which extends about 20 miles from Mr. Robert M. Bird's noble bridge at Chuttaee, to where the Amee falls into the Raptee below Cowree-Ram. The Amee itself is a deep narrow river, and has two large bridges on the upper part of its course; but during the rains, the whole valley to a breadth of 2½ miles is full of water, and communication with the civilized world almost entirely cut off It was no uncommon circumstance for a dâk traveller to be detained the best part of a day; and if there was any wind, the ferry became dangerous: as for carts or troops, their transit was impracticable.

3.—In this state of affairs, the Goruckpore Committee determined to run a bund across the valley, with some small bridges and a flying bridge, with *pucka* pier-head

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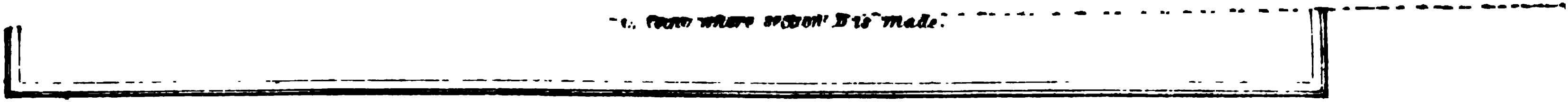
room where section B is made.

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at the Amee. The scheme was considered a very wild one, and impossible, by some; but the existing inconvenience was so great, and the advantage of a good military road in case of war with Nepaul, so evident, that it was resolved to make the attempt, and try what could be done; and the sanction of Government was requested, September 17th, 1845. His Honor the Lieutenant-Governor, in his reply, dated October 15th, 1845, was pleased to "approve and sanction the scheme;" and was glad to observe that so great a spirit of enterprise animated the members of the Goruckpore Committee.

4.—Thus encouraged, the Committee set to work in earnest. The bund might have been carried straight across the valley and jheel; but it was determined, in preference, to carry it along the water ridge, between the Raptee on one side, and the Amee on the other; in the hope that by thus running it along the natural limit between the two rivers, it would be less likely to be carried away. Were it to be done over again, the Committee would carry the bund straight across; as from the deep and extensive excavations for earth, no trace of the original form of the ground is now visible.

5.—It was at first supposed that a height of from 10 to 14 feet would be sufficient—the bund being 40 feet wide at the top, and 60 at bottom; a berm of 30 feet wide being left on each side, between the bottom of the bund and the canals from which the earth was dug.

Season 1845-46.

6.—The work was commenced by 300 prisoners and large gangs of hired laborers, on the 16th October, 1845; bricks were made and burnt, lime prepared; and the foundations of the Kussiar and Cowree-Ram bridges, of three arches of 18 feet each, laid on 25th December: those of the five arches, Bijra Bridge, on the 22nd February, 1846.

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7.—Quicksand being found under the Kussiar and Cowree-Ram foundations, they were piled. The Bijra foundations were 12 feet, on a layer of kunkur well rammed down.

8.—The main difficulty was to get tolerable mistrees. Mr. Reade's head-man was dead; and there was no one who had an idea above drain bridges of 12 or 16 feet span. The arches of the Committee's first bridges never, therefore, exceeded 18 feet. The men, however, got bolder in time; and the Committee have just completed an arch of 36 feet span, a very flat ellipse of only 9 feet rise.

9.—To get the bricks in these elliptic arches laid true, was another difficulty. In all bund work, a flat arch is better than a semi-circular one; but the mistrees had not an idea how the bricks should be laid: I had therefore to invent a little machine, of which I enclose a sketch, which easily enabled them to lay every brick true.

10.—During the hot weather of 1846, the Amee was bunded to clear out water from the foundations of a proposed bridge of 8 arches. In this job, much trouble was experienced from springs of water. However, by the rains, the foundations of the abutments and 7 piers were laid, and the walls carried up 6 or 8 feet, to let them settle well before turning the arches.

11.—The other three bridges were completed, but not plastered, before the rains; so that the bund was practicable, with the exception of the gap at the unfinished bridge over the Amee, until the 27th October, when a very heavy flood occurred, which topped the bund, and carried away a great deal of earth, in spite of all precautions in raising a ledge on the bund, and protecting the more exposed parts by branches of trees. I stood on the bund, when the waters were within a few inches of the top, and the waves of the 8 or 9 koss expanse of waters were beating on the range of leafy branches which had been placed to resist

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them. It was rather a nervous situation for the amateur architect. The great difficulty was to get earth, which could only be got from the high land at either end of the bund, a mile off; and the attempt had soon to be relinquished, and the bund left to its fate.

Season 1846-47.

12.—When the flood cleared away, it was found that two piers and one abutment of the Amee bridge had been completely undermined; the piers thrown flat; and the abutment fairly turned topsyturvy, with the bottom layers of kunkur and brick uppermost in the air. This, though disheartening, as showing the wretched soil we had to deal with, was so far satisfactory, as proving the substantial manner in which the bricks had been put together. The whole formed one huge mass, which we had exceedingly great difficulty in breaking up, as I had no practical knowledge of blasting, and was afraid of blowing up some of my prisoners.

13.—The prisoners and laborers were again set to work, and the earthwork of the bund was raised from 2 to 5 feet above its former level.

14.—Three new piers were added to the Amee Bridge, and to get out of the way of the insecure foundation of one of the fallen piers, the new one was placed beyond it, so as to make the centre opening 26 feet. These new piers and the new abutment were built on cylinders.

15.—A new bridge of seven arches of 24 feet span was also commenced near the former Bijra one, and 24 cylinders sunk from 15 to 26 feet, and the abutments and piers carried up to the spring of the arches.

16.—Another bridge of three arches of 24 feet span was also built, and arched over before the rains.

17.—It was found that all the *punniar* trees which had been planted at the sides of the bund, although they

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were taken to lay deep and good foundations, the worse the work was; and of course the feeling spread that the scheme really was impossible, and that the bund could not be finished.

22.—The Goruckpore Committee, however, were not disheartened, but determined to bridge the whole *koond*,

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which might be supposed to be the extreme waterway required in the severest flood, by a new bridge of fifteen arches of 24 feet span each. Syud Ilahee Buksh, an old distinguished thannahdar, who had built several bridges in Azimgurh, was called to the work; and, by dint of hard work, the whole fifteen arches were completed, and the bridge and bund made passable from end to end before the rains.

23.—The rains of 1849 were happily slight, and all the bridges and the bund remained uninjured.

Season 1849-50.

24.—The laborers have nearly all been dismissed, and the 300 prisoners are busy in plastering the bridges, and in building a connecting wall between the two Bijra bridges. The soil there is so very bad, that the earth will not stand at all, even though the Committee took merely the upper layer of the neighboring jheel; and they have been therefore obliged to build a supporting wall to prevent the earth slipping away.

25.—The whole of the sides of the bund have been thickly planted with coarse grasses and reeds, and the upper edge with different forest trees, which are now getting on nicely.

26.—The Committee believe the bund to be now quite safe and sound; but if kunkured, so much the better.

The waterway is as follows:—

1	bridge of	15	arches, each	24 feet span,	360 waterway.
1	ditto	11	ditto,	26 & 18 feet,	206
1	ditto	5	ditto,	18 feet,	90
1	ditto	3	ditto,	24 feet,	72
2	ditto	3	ditto,.	18 feet,	108
6	ditto	37	ditto,		836 ft. waterway.

27.—The earthwork at present is 13,144 feet, or about 2½ miles long 20 feet road-way, and 80 feet at the bottom,

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with berms of about 20 feet, and the average height is now about 18 feet.

28.—About 300 prisoners and 262 hired laborers, on an average, have been employed on the work, under the superintendence of Moulvie Reza Allee, Tehseeldar; Moozuffer Hossein, Jail Darogah; Syud Ilahee Buksh, Thannahdar of Amorha; and Ubdool Nubbee, Thannahdar of Bunsgaon, to all of whom the Committee feel much indebted for their zealous and gratuitous labors. They deserve to receive the thanks of Government. Soobrattee, mistree, has also done good service.

29.—The expenditure has been as follows:—

Season of 1845-46, ...	... Rs.	17,738	14	7
Ditto 1846-47, ...	... „	18,140	1	5
Ditto 1847-48, ...	... „	8,943	4	11
Ditto 1848-49, ...	... „	17,037	12	3
	„	61,860	1	2
Ditto 1849-50, to this time,...	„	6,704	15	8
Total,	... Rs.	68,595	0	10

30.—One main result of the Committee's experience is this, that in Goruckpore, it is best to build bridges on the upper crust, without any foundation. Wherever particular pains has been taken to sink good and deep foundations, there the misfortunes have always been greatest, whilst adjoining bridges without any foundation have stood firm.

31.—The most gratifying result, however, has been the unusual mark of the approbation and confidence of Government, in the spontaneous grant of Rs. 30,000 to assist the Committee in carrying on their public works.

32.—In closing their report on the Cowree-Ram bund, the Committee cannot but again call the attention of Government to the impolicy of tying the legs of the Execu-

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tive Engineers to their desks, instead of having accountants to examine and keep the accounts, and leaving the Engineers free to run about their divisions, and give their most valuable aid to the Local Committees. This Committee, with the exception of a slight sketch of a bridge, has received no assistance whatever from the trained Engineers of Government, and has consequently had to feel its way as it best could. It is absurd that large and important works should be left to mere amateurs, whilst the Engineers, who could direct them skilfully, are confined to mere desk-work, and allowed to remain almost useless. The present Barrack-master system is utterly bad; and the sooner it is mended the better. Till then, even with the very best intentions, Magistrates and Committees must waste much money in experimenting. They do not pretend to engineering skill, and all they can do is to do their best.

I have, &c.,

H. C. TUCKER,

Magistrate and Secretary,

One per cent. Road Fund.

P. S.—I have been examining the bund and jheel to-day, and it appears very clear that the jheel to the westward is rapidly silting up. In a few years the canal on that side will be filled up, and the lands raised several feet. This will be a new protection to the bund, and may prevent the Raptee coming this way.

It may be useful, perhaps, to remark, that none of the Committee's bridges cut their bunds, as is so frequently the case elsewhere. The reason is, that two spouts are allowed to each arch, so that all the rain-water which falls on the bridge flows off by the spouts, instead of draining

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off to where the bridge is attached to its embankment, and cutting the embankment off: thus leading to the common sight of a fine bridge standing detached by itself, its embankment cut, and no means of getting to the bridge, travellers quietly wading through the water below it. Mr. Bird's Chitaee bridge requires these spouts; half the embankment being regularly washed away every year by the rain-water from the bridge.

H. C. TUCKER.

No. V.—Minute by E. A. Reade, Esq., C.S., *Commissioner of the Benares Division, on the subject of the roads in the Goruckpore District, dated 23rd February, 1850.*

Review of the subject, *ab initio.*

1.—The subject of the roads in this district having recently elicited comments, it will be useful to take a review of past operations, and the principles which guided them, from the first establishment of the fund to the present time.

State of the district communications prior to the settlement.

2.—The communications of the country prior to the settlement, and I speak from experience extending back upwards of 20 years, were little better than cart-tracks. The Mahajun's bridge over the Teraina, between Cowree-Ram and Gola Gopalpore, was the only bridge, except the small Towee-ka-pool, over a nullah between the north and south parts of the town of Goruckpore, which existed, before the cession of the district, as the indications of former enterprize. No bridge has ever yet been built by the Executive Engineer in this district, though our tenure of it has approached to half a century; and it was not till 1821, that Mr. R. M. Bird first set the example of constructing bridges over running streams. The bridges over the Sowabowee, the Amee, and the Teraina, besides those in the south of Goruckpore, remain lasting

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memorials of his energy and abilities. He restricted his attention to the valley of the Raptee and the Ghâgra, evidently because the principal commerce of the country passed to it, to and fro of the productive portions of this district, and those south of the Ghâgra.

First measure since the establishment of the Fund. The Hurveylee Forest.

3.—As the survey of the district proceeded, and the assessment increased also, it became manifest that the future capability of the former to meet the pressure of the latter depended on the extension of commercial intercourse, and the use of roads and rivers. It was of the first importance that cart-tracks should be made thoroughfares to the main river of the district, the Ghâgra, or elsewhere recognized as roads, to prevent appropriation of the land; and this was easily accomplished.* But the barrier between the fertile parts of the district east and west, the Hurveylee forest running up diagonally to the Terai, was the difficulty to be overcome. The first exertions made were to pierce this obstacle, at several points in longitude as well as latitude. Roads Nos. III., V., VI., VII., XVIII., XXXII., and XXXVII., were thus opened through heavy jungle.

Next classification of roads.

4.—The next step was to classify the communications of the district. The settlement was completed, and thus enabled them to be classed pretty accurately according to their relative importance. Three classes were established:—1st, of main Military and Post roads; 2nd, of Commercial roads; 3rd, of Bye-roads.† Experience has shown that the estimate thus formed of each road has not, during the course of events in the last ten years, been affected so as to render a re-classification necessary.

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* It was reasonably supposed, that by making cart-tracks to any river good roads, bazars would spring up at the terminus. In most cases, experience has shown the correctness of the anticipation.

† 1st class roads, 60 to 40 feet wide; 2nd class, 50 to 40; 3rd class, 20 the minimum.

Original design for improvement of roads—how frustrated.

5.—My original design was that the surveyor should lay down new lines of road through the pergunnah allotted him for survey, preparatory to correction of the sinuosities in almost every road, which had been made simply by conversion of a cart-track into a thoroughfare ; but the surveyors were required elsewhere and were hurried off. With the exception of Lieut. Lawrence, little aid was rendered by any, and frequent applications to the Sudder Board for the services of an Assistant Surveyor and the necessary instruments, only received the reply that neither could be spared. Mr. De Silva was at length deputed to the district, and some partial reforms were effected with his aid. It may be remarked as a general observation that though the lines of communication have been fixed, the process of abbreviation by correction of sinuosities is still a desideratum. This remark does not apply to the new lines cut through the forest.

Latitudinal parallels.

6.—Before systematically undertaking this improvement, it appeared to be more a matter of necessity to complete a series of latitudinal parallels east and west of the district. Southward there existed : first, the road from the little Gunduck on the left bank of the Ghâgra to Fyzabad ; second, from Samere Bhagahuttee through Goruckpore to the same point. Northward, in adherence to this principle, the junction between the Gunduck and the Raptee, or Perrowna and Mhendawul, was first effected ; and subsequently a line was opened from Boggah through Goortee Ghât on the little Gunduck and Subeya, to the Dhumaila : but the line between that point and Bansee is still incomplete. A design to extend the line of road along the Nepaul pillars, on the north face of Pergunnah Bansee, through the intruding portion of the Nepaul territory, and along the line of the frontier to the great Gunduck, was abandoned—the nature of the country and the impracticability of boats navigating

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BODLEIANA BIBLIOTHECA

so far up that river, owing to the force of the stream and the quantity of trees imbedded in the channel, being conclusive arguments against the success of the project.

7.—The principles which regulated proceedings while these measures were in contemplation and progressing may be briefly stated: 1st, the future operations of the season were determined at an annual meeting of the Committee; 2nd, main roads were annually put in good repair; commercial roads received ordinary mending annually, and were repaired effectually once in three years; bye-roads were kept passable annually, and a discretion was left with the Superintendent to repair them effectually as he deemed necessary; 3rd, savings were annually accumulated for the purpose of building bridges, on a scale which required the aid of professional experience; 4th, Members of Committee were elected from residents in the interior of the district, whose advice, suggestions, and reports, were made the subject of Resolutions of the Committee at their annual meeting, or at special meetings, when such was deemed necessary; 5th, the Tehseeldars were directed to report to the Collector on the state of each road in his jurisdiction, and in some cases were necessarily charged with the duty of superintending the necessary repairs; but the system of contracts was preferred.

Principles adhered to by Committee.

8.—In several places, embankments as approaches to bridges were raised, and bricks made and burnt for the latter elsewhere. In some instances, bridges also were completed; but as I do not pretend to be an engineer, I deemed it right to abstain from entering upon any very extensive work, and better policy to incur a small annual charge for temporary bridges, and steadily to accumulate the funds necessary for the erection of suitable permanent structures of this description.

Savings made annually for the purpose of bridges.

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I was thus enabled to place a sum of Rs. 50,000 at the disposal of my successor in office.

Several good bridges built.

9. During the last five years the contributions to the register of bridges, which it is one of the laws of the Committee to keep up and revise annually, have been numerous and important. Whatever may be the difference of opinion regarding the chief work to which Mr. Tucker has applied his mind and energies, its comparative utility or prospective durability, the number of excellent bridges erected by him in other parts of the district, are more than sufficient memorabilia of his usefulness. The district roads, doubtless, are not in such order as could be desired; but at least they are practicable, the commerce of the country is not impeded, the thoroughfares have not been absorbed. The restoration of a road, at least in this district, is a simple matter, but the construction of a large bridge requires experience and talent of a particular order. Mr. Tucker will have made a good use of time and money, even if his greatest undertaking proves a failure; and I do not think this district can be better cared for in after years than by alternate changes in the executive, of officers content to make good roads, and capable and willing to build good bridges.

Suggestions in the matter of roads.

10.—It will probably be deemed advisable to give the benefit of the annual income, now in course of realization, to the effectual repair of the roads; and a few suggestions, the result of experience and observation, may be useful. In several parts of the road, where the soil is light, the road is now below the level of the country. Besides the scrapings from the kennel, earth must be added, and this should not be taken from the fields, as is too often the case, but from a trench three or four feet wide on one side of the

road. The depth of the trench will be in proportion to the quantity of earth required. There should be a small margin between the trench and the kennel of the road. If the excavation of this trench be even, it will be useful to the owner of the field for future irrigation. This *modus operandi* was tried on the Pipraitch road, between Puttrah and the forest, and answered well. In *dhoos* or pure arenaceous soils, accumulation of it on the road is only an aggravation of evil. These tracts are usually not extensive, and in such places the road should have a superstratum of firmer soil, or be metalled, if kunkur can be obtained. Generally in this district grass should not be separated from the top dressing, as it binds the soil, and enables it to resist the action of high winds. In the Terai portions of the district, it is a most grievous mistake to remove the sod. The only repair these roads ordinarily require is to fill in the indentation of the hackery wheels with turf; in renewing approaches to bridges it is a prudent precaution to maintain a slope from the bridge downwards to the commencement of the approach. In cases of excessive inundation, the surplus waters thus find a way of escape, and the safety of the bridge is ensured.

Correction of sinuosities; procedure recommended.

11.—The desideratum, as I have above stated, is the correction of sinuosities in the principal thoroughfares. The people have long been prepared for this improvement, and will generally be found very reasonable. In correcting a circuit, as the roads are universally wide, one thing is certain, that the area of the old will always exceed that of the new cut; years ago, when this subject was discussed with a native committee of land-owners, their remark was, that the tenure of land hard by a crooked road was never safe, the road would sooner or later be straightened; and therefore the sooner done the better. If these precautions were taken, there would not only

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be no grievance, but the owner of fields on the new line would often be a gainer: 1stly, the line to be laid down in the dry months, when the crops were off the ground; 2ndly, the line taken to be made the next year, or rent paid for it if deferred; 3rdly, the old road to be measured, and divided amongst those whose fields were taken up all or in part by the new line; lastly, that the line be marked off either by the Collector or by a Surveyor with a theodolite. In this way the most circuitous road in the district, from Barhul to Bhowapar was made straight without a single complaint, and it was admitted in many instances that the old road was more productive to the cultivator than his former land. If a standing crop must be cut down, there is one, and but one, way of settling the question of compensation, *viz.*, by a summary punchayet on the spot, and cash paid down.

Main road No. V.

12.—I think the road No. V. might be first subjected to this improvement with advantage, being, I think, about the most crooked of the main roads, and where the alteration is likely to be hailed with satisfaction, and it would serve as a precedent for others, that of No. VIII. being now of long date and forgotten. On the same road, if practicable, I suggest the construction of a bridge over the Môn Nuddee—the bricks for which were burned six years ago.

Commercial road No. XVI.

13.—Of commercial roads, one only appears to require a suggestion from me. No. XVI. is the great commercial road of the district; and for the safety of Mr. Bird's bridges upon it, inspection and effectual repair appear to be necessary.

Northern parallel—what is required.

14.—Of other roads, too, I need only also note one. It would be as well to complete the northernmost parallel from the Dhumaila to Bansee, and to construct a bridge, of masonry

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pier, and sâl timber platform, over the Powye Nuddee, at the point where the parallel and the main road No. III. cross each other.

Suggestions in the matter of bridges.

15.—To the above suggestions, I would add others connected with bridges in this district. Mr. Tucker recently pointed out the advantage of furnishing bridges built by his predecessors with spouts through the parapet walls, to carry off rain falling on the bridge, which, as he observes, otherwise makes rifts in the earthen approaches. In the jungle and Terai it will be safer to lay platforms of sâl beams, cross-pieces, *chylas*, earth, and kunkur, over all, on masonry piers, built up on *jainowots* or curbs of *jumun* wood, (which does not rot in moisture), than to build arched bridges. The small brick called the *lakhowree* is better suited for bridge piers than the large brick used in other buildings. Every notable bridge in the district should be inspected and reported upon by some competent person, at least once a year.

CAMP BURHULGUNGE : } E. A. READE,
The 23rd February, 1850. } *Commissioner, Benares Division.*

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MEMORANDUM—BRIDGES IN THE GORUCKPORE DISTRICT.

			Arches	Value.	
No. 1	Sohun Lall, a mahajun of Benares,	Teraina, ...	9	10,000	
					10,000
2	R. M. Bird, ...	Amee Nuddee, ...	7	6,000	
3		Sowa Bhowa, ...	3	4,000	
4		Teraina, ...	3	3,000	
5		Great Mukuneya, ...	3	3,500	
6		Toorkmanpore, ...	3	1,600	
7		Burial-ground, ...	1	1,600	
					19,700
8	J. Armstrong, ...	East of Cantonments, ...	3	2,800	
					2,800
9	E. Currie, ...	Towees Pool, ...	1	650	
10	Ditto, ...	Captaingunge, ...	3	2,500	
					3,150
11	E. A. Reade, ...	Little Mukuneya and Busseadeeh, ...	4	3,700	
12		Goreya Bâgh, ...	3	1,600	
13		Koorna Nuddee, ...	3	1,550	
14		Silhonee Ditto, ...	3	1,300	
15		Teraina, ...	3	2,191	
					10,341
16	H. C. Tucker,	Jhurrye Nuddee, ...	3	3,000	
17		Toora Ditto, ...	3	1,435	
18		Fureeud Ditto, ...	3	1,865	
19		Saeginwah, ...	2	1,803	
20		Amee, ...	9	11,826	
21		Khuleelabad, ...	1	606	
22		Khood Nullah, ...	1	1,113	
23		Kutnya, ...	3	2,363	
24		Oorwara, ...	2	936	
25		Khajera, ...	1	695	
26		Muchooe Nullah, ...	3	1,220	
27		Munwarama, ...	5	6,809	
28		Goorgahwa, ...	1	772	
29		Ramrekha, ...	3	3,493	
30		Boornya, ...	3	1,350	
31		Kwana, ...	5	21,000	
		Cowree-Ram.			
32		One Bridge, ...	15	81,547	
to		One ditto, ...	11		
39		One ditto, ...	5		
		Four ditto, ...	3		
40		Duldulha, ...	3	6,000	
41		Toora Nuddee, ...	5	4,000	
42		Furhein, ...	6	6,000	
					1,57,833
		Grand Total, ...			2,03,824

E. A. READE,
Commissioner.

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No. 8.

COMPARATIVE COST OF CARRIAGE ON METALLED AND UNMETALLED ROADS.

Extract of a letter from THE POSTMASTER-GENERAL, *North-Western Provinces, to* THE HON'BLE THE LIEUTENANT-GOVERNOR, *dated 30th September, 1850.*

A calculation based on the returns of the Bullock Train goes far to prove that, without any reference to the general interests of the country, the want of a road to Lahore annually causes Government to incur an expense greater than would keep in repair, and pay interest on, the original cost of construction of a metalled road.

The following statement shows the actual number and weight of packages conveyed from Allahabad to Cawnpore, and from Meerut to Umballa, in the month of May, 1850, together with the cost of establishment on each road. I have selected May as a month in which the establishment was fully employed, and one during which there are no difficulties arising from rain.

	Miles.	Number of Packages.	Gross Weight.	Cost of Conveyance.
			Mds. Srs. C.	Rs. As. P.
From Allahabad to Cawnpore,	125	3,594	6,002 26 9	1,743 0 0
From Meerut to Umballa, ...	128	1,992	2,929 1 0	2,632 10 8

The distances are nearly equal to each other, and to the distance between Kurnaul and Loodiana; so that the comparison can be at once applied to the latter line.

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Rs A. P.
0 1 0¼ per ton per mile.

Rs. A. P.
0 3 1½ per ton per mile.

The result is that the actual cost of conveying and guarding one ton of goods on the metalled road is Rs. 8-2-1, while on the unmetalled road the cost for the same distance is Rs. 25-2-6. From these data it is easy to estimate the cost of leaving the road in its present state. The sums mentioned merely show the actual charge of haulage in dry weather, and do not include the cost and wear and tear of carts and waggons, or any estimate of the loss occasioned by the unmetalled road by delay caused by rain.

If the Markundah River be left out of consideration, as impracticable, there is no engineering difficulty on any part of the line between Kurnaul and Loodiana. The streams which intersect it are of no great width. I believe kunkur is to be found in the neighbourhood of the road, and for upwards of 40 miles it runs through the territory of the Maharajah of Puttiala.

Even if the whole were completed by the British Government, the cost could hardly exceed Rs. 5,000 a mile. At this rate, the total cost would be about six and a half lakhs of rupees. The annual cost of keeping a metalled road in repair is, I believe, about Rs. 300 a mile, all establishments included. The total annual charge on the road in question may therefore be reckoned at Rs. 70,900:—

	Rs.	As.	P.
Interest on Rs. 6,50,000 at 5 per cent., ...	32,500	0	0
Annual repairs of 128 miles, at Rs. 300 per mile, ...	38,400	0	0
	70,900	0	0

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The difference in the cost of the conveyance of each ton of goods would be, as above, Rs. 17-0 5.

	Rs.	A.	P.
Charge for conveying one ton on unmetalled road, ...	25	2	6
Charge for conveyance of one ton on metalled road, ...	8	2	1
Difference, ...	17	0	5

If, therefore, the weight of goods, for the cost of conveying which Government is charged, amounts in the year to 4,164 tons, the whole cost of making and keeping the road in repair would be covered.

I have no means of knowing the weight which actually passes between the Provinces and Loodiana, *en route* to the Punjab, Jullunder, Dooab, and Ferozepore; but if Ordnance and Commissariat stores, baggage of troops, and miscellaneous articles for Civil establishments, are taken into account, I conceive that on the average of years, the amount would not fall short of that indicated above.

To this must be added many advantages, the money value of which cannot be shown; such as increased speed and regularity of the mails; the absence of all obstructions to the movement of troops; and the avoidance of the thousand annoyances, delays, and injuries, which are now caused by a shower of rain.

It is needless to dwell on the injury to the traffic and general interests of the country by a state of things which triples the cost of carriage, and for four months in each year practically closes all communication above Kurnaul and Saharunpore.

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On the Trunk Road, a pair of bullocks can with ease drag a ton of goods. Even if, therefore, a toll of Rs. 5 was imposed on each cart drawn by two bullocks, the merchant and public would gain Rs. 12 in each ton of goods passing between Kurnaul and Loodiana.

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No. 9.

IMPROVEMENT OF COMMUNICATION BETWEEN THE GANGES AND THE HILLY TRACTS IN SOUTH MIRZAPORE.

Report by E. A. READE, ESQ., C.S., *Commissioner of the Benares Division, on the measures taken for the improvement of the Mirzapore District, by opening new lines of road leading to the Singrowlee Coal-fields, and other places beyond the Kymore range.—In a Letter No. 81 A., dated 26th April, 1851, addressed to the Sudder Board of Revenue, N.-W. P.*

WITH reference to the correspondence noted in the margin,* I propose in the present address to resume report of progress in the researches made and measures taken for the improvement of the Mirzapore District, by opening out lines of communication between the Ganges and the hilly tracts to the southward.

* *Previous correspondence referred to.*

Commissioner, to Sudder Board of Revenue, No. 64, dated 12th March, 1849. (Reporting result of investigations made by Mr. Roberts and himself in the southern portions of the Mirzapore district, with surveys of the lines between the Ganges and the Soane.)

Orders of Government, No. 2615, dated 11th August, 1849. (Suggestions approved, but further information deemed necessary.)

Commissioner to Sudder Board of Revenue, No. 173, dated 29th July, 1850. (Regarding the Kewai Pass, the best passage in the Kymore range between Mirzapore, north and south of that range, with plans and estimates.)

Government orders, No. 3142, dated 11th October, 1850. (The measure approved, and the estimated outlay sanctioned.)

2.—The latest correspondence† with Mr. Roberts is herewith forwarded, with plans and surveys.‡ I have added a map of the district,§ on which I have traced the

† *Recent correspondence now submitted.*

Wroughton's Map of the Mirzapore District.

Mr. O'Callaghan's survey of the Ahrora Road.

Mr. Burke's survey of road from Singrowlee to Kewai Pass.

Ditto ditto of ditto, showing the level of the country.

Mr. Roberts, to Commissioner of Revenue, No. 84, 7th September, 1850. (Forwarding Mr. Burke's survey of the Singrowlee Road, with estimates of this and other roads, amounting to Rs. 95,000.)

Commissioner, No. 47, dated 17th February, 1851, after inspection of the lines, remarks on the necessity of a good road from Mirzapore to the Burdeeh frontier, and of ascertaining the practicability of the direct line from Mirzapore to Taur-ke-deour, to avoid the great circuit by Ghorawol and Shahgunge.

‡ Not printed.

§ *Vide* Appendix.

lines, which I hope may be converted into good roads in course of time.

3.—It has already been remarked that the subject must not be considered solely with reference to the transit of coal from the mine which has been opened in Singrowlee, at the extreme point south and west of the district. Coal-fields undoubtedly exist to much greater extent in Burdeeh and Sirgooja, on the west and south of the border, though no mine has yet been opened there. It is the same on the eastern border of Singrowlee. Coal-fields exist extensively in Palamow, and will probably be found nearer still in Nuggur Oontaree.

4.—Besides this, the development of great natural resources, the welfare of the people, and efficient administration, depend a good deal on the success which may attend the advocacy and execution of measures against great natural obstacles, in a district where they prevail to a remarkable extent.

5.—Before treating of each line of road marked on the map, and giving each its number and name for the sake of future reference, I think it necessary to remark that there are two ways of viewing the matter,—one with reference solely to Mirzapore; the other with reference to adjacent districts, and to other stations upon the Ganges. The present enquiry having originated partly in Mr. Roberts' commendable desire to effect improvement in the southern parts of the district, and partly with the Company who have opened the mine above mentioned, and have their depôt only at Mirzapore, the bias of their enquiries has naturally been towards this point, in preference to any other Gangetic station. If it were possible at once to convert the lines marked on the map from propositions into realities, the effect would be quite as great, if not a greater, impulse to commerce, from the

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southern parts of Mirzapore and the districts beyond, towards the stations of Chunar and Benares, than from those tracts to Mirzapore. It would almost seem a provision of nature that the latter should look to Burdeeh and the country beyond it for its commerce, and to give to the former stations the command of the most practicable route to Singrowlee and Sirgooja in one direction, and to Oontaree Nuggur and Palamow in another.

6.—The lines of actual and proposed road, marked on the map, may thus be numbered and named:—

No. I. *The Burdeeh Road.*—Mirzapore to the Burdeeh frontier, and through that district to the coal-fields in Singrowlee.

No. II. *The Ahrora Road.*—Benares and Chunar, converging to Ahrora *viâ* Taur-ke-deour, and the Kewai Pass to the Soane.

No. III. *The Tehseeldaree Road.*—From the Burkutcha Pass, six miles from Mirzapore on No. I., to Taur-ke-deour.

No. IV. *The Singrowlee Road.*—From the Sirgooja frontier and Singrowlee to the Soane, joining No. II.

No. V. *The Oontaree Nuggur Road.*—From the Nuggur Oontaree frontier, passing westward of Joroo-kar, to the Soane, No. II.

7.—No. I. *The Burdeeh Road.*—Geographically, Mirzapore is the nearest point on the Ganges to the coal-fields which have been discovered in this part of India. The direct route is less than 80 miles, and there is reason to believe that coal will be found still nearer in the Burdeeh District, though no such hope can be entertained

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for that of Mirzapore. The most elaborate research has only discovered one coal-field within its precincts, and the area of this does not exceed 12 square miles. To avoid the political difficulty of negociating the construction of a good road from the Soane to the coal fields with the Rewah Chief, an endeavour has been made to ascertain the practicability of opening a line to this point, only so far deviating from the direct line as to keep the route within the limits of the Mirzapore District. The nature of the country west of Agoree and Singrowlee presents, however, such insurmountable difficulties that the design has been abandoned. Either, therefore, the road from Mirzapore to the coal-fields must be made direct, and this is perfectly practicable, if political difficulties are not raised; or a circuit of nearly thirty miles must be the alternative. The resources of the Burdeeh District appear to be peculiarly rich. The discovery of coal has been followed by that of copper ore. Iron is abundant; and its slate and marbles, could they be transported, would find a ready market at Mirzapore, and thence elsewhere. Even if impediments are put in the way of completing a road through this foreign territory to the coal-fields, there does not appear to be any good reason why so much of the line as extends from Mirzapore to the Soane should not be made a good road, as an example. The route through Burdeeh is adhered to by the bunjarahs who carry the coal, because of the certain supply of water at all seasons, and its being the shortest. The distance to the Soane is about thirty-six miles. If a carriage road were made for the remaining distance—forty-two miles—at least double or even treble the quantity of coal would be brought to the Ganges.

8.—It seems to me that a thoroughfare through Burdeeh must be the inevitable consequence of making a good road towards it from the Ganges to the Soane.

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Little is now required to effect this. The first barrier—the upper Vindyan range—has been effectually surmounted by the Burkutcha Pass. The principal obstacles remaining are the Beylun Nuddee and the Kymore range. In the Mirzapore District, the former must be crossed to pass from the Ganges to the Soane. The present pass of Bussihee, on the latter, presents few of the difficulties which have been triumphantly overcome at the Kewai Pass. It would be a minor undertaking for Major Drummond's foreman, Gyadeen, who, both at Burkutcha, and still more at Kewai, has exhibited great professional ability. In fact, nothing is required but the consent of the Government to the undertaking and the outlay.

9.—No. II. *The Ahrora Road.*—From Benares to Ahrora, which, next to Mirzapore, is the greatest market in the district, a noble road was constructed by Rajah Cheyt Singh. It has been long neglected, but the attention of the Benares and Mirzapore Committees has been called to it, and the Rajah of Benares has promised to repair the portion within the limits of his estates. From Chunar to Ahrora the road is good, and an offer has been made by a public-spirited individual to supply some bridges, if the line is metalled by the Committee. The pass on the upper Vindyan range at Sookroot has been badly done, and will require to be reduced at a cost of 1,300 to 1,500 rupees before it can be made available for wheel-carriage: this work was executed under the late Captain Thomson's superintendence, his head-quarters being at Ghazeepore. Beyond this is the valley of the Beylun, sometimes also called that of Shahgunj, though the former is the more correct appellation. The Beylun is a treacherous stream, that will require to be well bridged, and to be furnished with a causeway and tunnels, at intervals, for a considerable distance. Beyond this is the table-land of Taur-ke-Deour, the site selected for the new Tehseeldaree

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of South Mirzapore; the building at Shahgunj being in utter ruins, and the notable insalubrity of that place having rendered a change of site necessary. Further beyond this is the Kewai Pass, now available for vehicles of every description, and already attracting to itself the commerce of the country above and below it; and, lastly, the Soane, on which the ferry has recently been declared public. If ever the Soane should be crossed by a bridge within the limits of the Mirzapore District, it will be at this point, intermediate of the Kunher and the Rehud. Leaving this, however, for the consideration of posterity, it will be seen that on this line we have only to complete the series of improvements which have been partly effected.

10.—No. III. *The new Tehseeldaree Road.*—On reference to Mr. Roberts' report, it will be seen that he and the Committee would have adhered to the circuitous line by Ghorawol, and have recommended a considerable outlay for repair, or rather, I should say, for construction, of this line. Having ascertained that a route did exist between Shahgunj and its neighbourhood and Mirzapore, of which, too, the account was more favourable than ever could be given of a long circuit through low country, I thought it as well to suggest to Mr. Roberts to have it surveyed by Major Drummond's foreman above mentioned. This has been done, and though his official reply has not been received, the result is as I anticipated. The preference of the new and direct route to the old one is admitted. The distance will not only be considerably less, but the expense also. It will in time serve the purpose which gives its name. The remittances from the Tehseeldaree of South Mirzapore will reach the head station a day sooner than they do at present, and if commerce is impeded in the Burdeeh District, it will find its way by this route to Mirzapore from the southern border.

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11.—No. IV. *The Singrowlee Road.*—This has been recently surveyed by Mr. Burke, whose plan accompanies.* It extends only to Singrowlee Khas, but the coal mine is at a short distance, and the Sirgooja frontier can be reached with the sole difficulty of crossing the Rehud a second time. This line of road will open out the richest portion of the pergunnah of Singrowlee, and the coal-fields which lie beyond it to the Soane. It may not be necessary in most instances to build masonry bridges over the numerous mountain streams which intersect it. The materials for wooden platform bridges, on stone or masonry piers, are abundant.

12.—No. V. *The Oontaree Nuggur Road*—This is at present only a straggling path for pack-bullocks, but I have thought it right to give it a place in the list, because it must eventually become a great commercial road. If the exertions to bring coal to the Ganges from the vicinity of Burdeeh are attended with success, it will not be long before other mines are opened, and competition ensues. If native speculators can mine on one side of Pergunnah Singrowlee, it may safely be predicted that similar experiments will be made on the other side. The line will pass near Tokone, already a market of considerable note for hill produce.

13.—I have now to consider the cost of these undertakings, the means available, and the agency to be employed.

14.—On the question of cost, it will be necessary to decide whether each or any of the proposed lines shall be made a good road, practicable at all seasons. In my former report, estimates were submitted for parts of the proposed lines, calculated to insure their being made

* Not printed.

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available for commercial purposes for the greater part of the year. The estimates of the expense which may suffice to palliate difficulties must be obviously much less than those which are framed with the object of completely surmounting them. I have requested Mr. Roberts to frame his estimates on the latter principle, in order that the Government may thus be enabled to see in its full extent the magnitude of the undertaking.

15.—It will prevent confusion, if I append to this address, separately for each line, Mr. Roberts' estimates and my own in part; his proposition to make a circuitous road by Ghorawol having been admitted by him to be injudicious, and his letter of date 7th September last making no provision for new lines, in the preference of which he also concurs. The estimates annexed, therefore, embrace all the particulars of expense for all the lines, which further research, since his report was written, has shown the necessity of recommending to be adopted.

16.—The lines I have placed in the order of their importance. The Burdeeh Road and the Ahrora Road, the two great lines from the Ganges to the Soane, should undoubtedly have our first consideration.

17.—Regarding the first, simultaneously with completing the line from Mirzapore to the Soane, by bridging the Beylun and reducing the Bussihee Pass, reference (I would recommend) should be made to the Rewah authorities regarding the line passing through Burdeeh. The Chief of Rewah, if properly advised, might be enabled to see the benefit to his territory which would be gained by his following the example of the British Government in completing the line on his side of the Soane.

18.—Regarding the second, or the Ahrora Road, the reduction of the slope of Sookroot, the bridging of the

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Beylun, and the completion of the line from the foot of the Kewai Pass to the Soane, are the desiderata.

19.—The works to be executed on these two lines may very well be entrusted to Mr. Roberts, and the engineering ability of Gyadeen, Major Drummond's foreman, so repeatedly mentioned. Both lines may be completed in every respect in the course of the ensuing season.

20.—Regarding the new Tehseeldaree Road no proposition is made at present. Before further steps are taken, Mr. Roberts will furnish the separate report called for from him.

21.—Regarding the Singrowlee Road, Mr. Roberts' report with Mr. Burke's survey give full information. The estimate of the expense is too great for me to recommend the Government to undertake the experiment without first deputing a professional officer. There cannot be a doubt, I think, that the best, in fact the only practicable line, has been selected. Mr. Burke, the surveyor, learned his work under Major Wroughton. But the Government must determine the question whether this line is to be made, as proposed, into a good road, at the cost indicated by the estimate, or whether existing difficulties are to be palliated at a much less cost. The necessity and the advantages of opening out a communication with this hitherto little known and uncared-for portion of our territory have been fairly represented, and the Government will give these points the consideration they deserve.

22.—The deputation of a professional engineer I advocate for these reasons. It is desirable that the Government should have the best professional advice obtainable; first, as regards the coal-fields in Singrowlee, Burdeeh, and Sirgooja; and, next, as to the practicability of rendering the Rehud navigable from Singrowlee to its junction

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with the Soane. Little is known of the former: it is dangerous in parts, but the fact has been ascertained that at certain seasons it is navigable. If the dangers are susceptible of removal, I should think it of primary importance to attempt this great improvement before that of a road, as suggested, practicable at all seasons. Make the Rehud navigable with safety, and a coal depôt, if not a town, as a natural consequence, will be established on the banks of the Soane.

23.—Regarding the Oontaree Nuggur line no proposition is made. A rough estimate is appended, merely to assist in showing the cost necessary to develop the resources of South Mirzapore. On this line, too, professional ability is in request. Further information is required as to the coal-fields on this border of the district, in Oontaree and Palamow. The practicability of bridging the Kunhur, or of rendering it navigable, as with the Rehud, is a similar point of importance.

24.—I trust the propositions* of completing the main lines from the Ganges to the Soane, and of deputing a professional officer to the western and eastern sides of Singrowlee during the ensuing season, will be approved and supported by the Board.

	Rs.
* Burdeeh Road, ...	19,762
Ahrora Road, ...	16,875
	36,637

25.—On the subject of available means for these enterprises, such would seem extravagant in a district where the revenue derived from the Road Fund is Rs. 1,800, and the Ferry Fund income is about Rs. 7,000 per annum. But the Government derives from the Mirzapore District a revenue peculiar to it, and unknown elsewhere, in the shape of duties on quarried stones. It was at one time thought advisable to abandon this tax, but it was very doubtful whether the substituted license of extortion by individuals

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would not be more prejudicial to the interests of the public. It was not therefore considered advisable to relinquish it, but the duties, previously in several cases prohibitory, have been considerably lowered. The income derivable from this levy will probably reach Rs. 15,000 per annum, and I earnestly recommend the Government to concede this tribute to the benefit of a district which, of all others, presents the greatest natural obstacles to commercial intercourse, is least endowed with the means of correcting them, and hitherto has certainly had, till very lately, but little aid from the Treasury.

26.—This boon, however, will not suffice. The union of Road, Ferry, and Quarry Funds would be sufficient to keep the thoroughfares, once made, in good order, but they would not also suffice to cover the debt of the original outlay in construction. It follows, therefore, that the Government, if it resolves on sanctioning the improvements proposed, must repay the expense by levy of tolls, at the passes* in the Kymore range, and in the upper Vindyan range, if such should hereafter be found necessary. To the trader, the accommodation of a good pass is so great, that a small toll, levied fairly, will not excite discontent, or divert the course of traffic. It is but recently, in the absence of any control on the part of distant authorities, that such a tax was levied for the privilege of toiling up narrow and dangerous ascents, with half the burden that can now be transported with ease and safety. Care must be taken against extortion, which is most to be dreaded; and as a necessary preliminary to the demand of a toll at the passes in the Kymore (at Kewai *in præsenti*, and Bussihee, *in futuro*) the lines between the Ganges and the Soane must be completed.

* *Kymore*: Kewai, Bussihee.—*Vindyan range*: Burkutcha, Sookroot.

E. A. READE.

No. II.—*Abstract of Estimates for the Construction of new Roads through South Mirzapore.*

I.—The Burdeeh Road.

Mirzapore to Burkutcha, six miles, ...	Rs.	600	
Road dressed and repaired, twenty miles, ...	„	1,000	
Road raised four, @ Rs. 250 each, ...	„	1,000	
5 Causeways, each Rs. 250, ...	„	1,250	
The Bukkhur Causeway, ...	„	750	
Goortootiva Bridge, ...	„	800	
15 Drain bridges, ...	„	1,312	
10 Miles new road, @ Rs. 50, ...	„	500	
3 Causeways, @ Rs. 250, ...	„	750	
Bridges over the Beylun, ...	„	5,800	
Bussihee Pass, ...	„	6,000	
			19,762 0 0

II.—The Ahrora Road.

Chunar to the base of Sookroot, sixteen miles, @ Rs. 20, ...	Rs.	320	
Reducing the slope of the ghât 3,000 feet, 1 per foot, ...	„	1,350	
Sookroot to Gola, three miles, @ Rs. 150, ...	„	450	
Gola to Russeehee, eleven miles, @ Rs. 50, ...	„	550	
Russeehee to Bichee, two and a half miles, raised three feet, ...	„	1,000	
Bichee to Taur-ke-deour, two and a half miles, ...	„	105	
17 Drain bridges, ...	„	1,500	
Bridges over the Beylun, ...	„	4,000	
Bridges over the Dehrwer, ...	„	3,000	
Contingencies,...	„	225	
Taur-ke-deour to Chupka, three miles, ...	„	150	
Chupka to Kewai pass, two and three-quarters miles, ...	„	137	
16 Drain bridges, ...	„	2,220	
5 Ditto of larger size, ...	„	1,868	
			16,875 0 0

III.—Tehseeldaree Road.

(*Approximate.*)

Forty miles, @ Rs. 50, ...	Rs.	2,000	
Bridge over the Beylun, ...	„	5,000	
Estimated cost of reducing es of ascents, ...	„	8,000	
			15,000 0 0

IV.—Singrowlee Road.

(Professional Estimate.)

Clearing surface, reducing slopes, and raising low grounds, ...	Rs.	1,469	8		
24 Drain bridges, ...	„	6,468	4		
First Part.					
5 Causeways, ...	Rs.	1,859	12		
4 Bridges, ...	„	6,512	11		
8¼ Metalled road, ...	„	8,000	0		
Contingencies, ...	„	724	0		
				25,034 3	
Clearing jungle, dressing road, and reducing slope of steeps,	Rs.	11,235	0		
40 Drain bridges, ...	„	6,835	0		
1 Bridge, ...	„	1,215	0		
Second Part.					
15 Causeways, ...	Rs.	8,154	0		
2 Dams, ...	„	3,870	0		
Contingencies, ...	„	940	0		
Metalling in part, ...	„	4,800	0		
				37,049 0	
					62,083 3 0

V.—The Nuggur Oontaree Road.

Approximate Estimate, ... Rs. 25,000 0 0

Grand Total, Rs. 1,38,720 0 0

E. A. READE.

No. 10.

ROADS IN THE AGRA DISTRICT.

Memorandum on the Roads in the Agra District, by M. R. GUBBINS, ESQ., *Magistrate and Collector.*

Having, during the last four years, acquired much information regarding the district roads of Agra, I have recorded it in the accompanying statements and map, for the information and future assistance of the Road Committee.

2.—They contain a record of 57 lines of road altogether, including all the most traversed routes. Some others there may be found deserving of being added, and these, where discovered, should be appended to the list; but probably it contains already more than enough to employ fully the local funds.

3.—The roads have been distinguished into four classes; *viz.:*—

1st Class, or main lines;
2nd Class, or much-traversed lines of commerce;
3rd Class, or less general lines of traffic; and
4th Class, including all roads of less importance.

There are—

5	roads of the first class;
8	ditto of the second class;
30	ditto of the third class;
14	ditto of the fourth class; being
57	in all.

4.—The district contains—

87¼ miles of metalled road.
313¼ miles of aligned and regularly made road.
334¾ miles of mere hackery-track roads.

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Upon most of the aligned and made roads there are drain-bridges, but many are still without them. The only bridge of any size constructed by the Road Committee (excepting the works on the two trunk roads to Mynpoorie and Allygurh, now placed under the Executive Department) is one of three arches, on the Muttra high-road (No. 3), at Rasoo.

5.—In this district, I would recommend the Local Committee to bestow their future attention and funds chiefly towards the alignment and cheap construction of regular kutcha roads, until the whole 57 included in the statements (omitting those specially excepted) have been so completed; erecting bridges where especially required, but leaving the ordinary drain-bridging for future completion. My reasons are these: that—

6.—*First,*—By making a good alignment, a great saving in distance is invariably gained; and the limit of each road being thereby permanently fixed, future encroachment is prevented.

Secondly,—When once the road has been well aligned, every rupee spent upon its future repair is *well spent;* and year by year it is sure to improve.

Thirdly,—The contrary results are yearly taking place in the case of the hackery-track roads; because, 1*st,* they are yearly getting worse, by the zemindars digging away the earth of the road to repair their hedgerows, which it is impossible everywhere to prevent. The road, therefore, gets yearly deeper, or more below the surface of the country, and therefore worse; 2*ndly,* everything spent in repairing (roughly of course) such roads is lost; for it is always found necessary to abandon these deep-dug hackery tracks, and take a new alignment through the high land of the fields, so that all sums previously expended are lost.

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Fourthly,—A broad aligned road, not unduly raised, is always a better thoroughfare than a hackery track, even though unbridged. It must be clearly understood that where roads are much raised, bridges become indispensably necessary. But it is an error to raise them much at first. Never mind their being a little under water during the rains. So also, and much worse, are the deep-dug hackery tracks; whereas in the dry weather you have a far better thoroughfare in the new, broad, aligned, straight, and short road, than in the old, narrow, tortuous, crooked, and lengthy hackery track.

7.—Then, as funds permit, after completing the alignments, raise the road in those parts where it is most necessary; and where raised, bridge it simultaneously.

8.—It is, of course, a great recommendation to this sort of slight alignment and making, that it is so cheap. Referring to the cost of the last new alignments made in this district, I find it to be the following :—

No.	*Name of Road.*	*Cost per mile.* Rs.	As.	P.
15.	Etmadpore to Muttra, ...	36	7	0
16.	Shumshabad to Futtehabad, ...	61	8	0
21.	Bah to Butteysur, ...	25	0	0
22.	Phureyrah to Buttesur, ...	25	0	0
23.	Pinnahut to Papree Nagur, ...	30	8	0
24.	Ditto to Bhudroly, ...	24	5	6
28.	Ferozabad to Julleysur, ...	57	1	10
	Average charge per mile, ...	35	11	1

During the past four years our Committee has accomplished no fewer than eighteen new lines of kutcha road, as noted in the margin.* The first lines were too much raised, and had to be bridged immediately. The rest have been constructed in the manner above described and recommended.

* Nos. 4, 8, 10, 11, 12, 15, 16, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

9.—It is an excellent plan to reduce all the roads in each district to a regular list, and to number them. Future orders, proceedings, and references are much facilitated thereby. The idea was first suggested to me by Mr. E A. Reade, Commissioner of Benares, whose plan I have here adopted.

10.—The pergunnahwar abstract lists of roads have been translated into the vernacular, and a copy furnished to each Tehseeldar, who should be required to report, by the 15th September of each year at latest, the repairs and new works proposed by him to be undertaken in his pergunnah, with the probable cost of each. These reports should be disposed of by the Committee, and orders should reach every Tehseeldar before the 1st of October, in order that the earth-work should be done while the soil is moist, and not too dry to prevent its binding.

M. R. GUBBINS,
Magistrate and Collector of Agra.

Agra, 10th February, 1854.

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Statement showing the Roads of the Agra District and their present condition.

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles. Pergunnah.	Length in miles.	Total length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere hackery track.	Bridged, or not; and if not, how many known to be wanting.	Remarks.
1	I.	1	Agra to Mynpoory (Trunk Road).	*Viâ* Shahdra, Etmadpoor, Ooseynee, Ferozabad, &c., to Beejeypoor, in pergunnah Ferozabad, the boundary of the Agra District.	Huzoor Tehseel.	1	0	0	0	0	60 drain bridges constructed.	Metalled road under charge of the Executive Engineer, Grand Trunk Road.
					Khundowly,	19	0	0	0	0		
					Ferozabad,...	12	32	32	0	0		
2	I.	2	Agra to Allygurh (Trunk Road).	*Viâ* Khundowly.	Huzoor Tehseel, included in Mynpoory Road.						11 do. do.,	Ditto ditto ditto.
					Khundowly,	10	10	10	0	0		
3	I.	3	Agra to Muttra,	*Viâ* Secundra to Furrah, to the district boundary in the village of Dhanna Teyja.	Huzoor Tehseel.	9	0	9	0	0	...	The high road to Muttra metalled throughout. A greatly frequented road by travellers, and carts conveying salt, cotton, and grain from the westward. The metal of this road was almost entirely destroyed in 1850, and since the rains of 1851 it has been under a course of re-construction, several miles being
					Furrah, ...	17	26	17	0	0	31 do. do., including three arch bridges at Rasoo. No more bridges required.	

												entirely re-made in that and each of the successive years. The road, with the trifling exception of a few furlongs in the 10th and 11th mile, is now complete, and in excellent order. Some spare heaps of kunkur should be placed along it, to be available for the repair of any injury, immediately on its occurrence.
4	L	4	Agra to Bhurtpoor, *viâ* Achneyrah.	*Viâ* Bichpoory, Raebha, Achneyrah, to the district boundary in Mouzah Toorkia.	Huzoor Tehseel. Furrah, ...	12 9	0 21	4 0	8 9	0 0	23 drain bridges constructed.	From Agra to Badla. About four miles metalled. Kunkur is now laying on the bridge also. This is the great salt road from Bhurtpoor, and is more traversed by salt, cotton, goor, and other commerce, than any other road in the district; its width is insufficient, and a proposal has recently been submitted for the Commissioner's sanction to widen it, by taking in more land on either side. *Vide* Secretary Road Fund's letter No. 15, dated the 31st December, 1853.
5	L	5	Agra to Gwalior,	*Viâ* Rohtah, in Pergunnah Huzoor Tehseel and Tehrah Beerye Seiyan, Pergunnah Eradutnuggur, to Jajow, the district boundary in Pergunnah Kheyragurh.	Huzoor Tehseel. Eradutnuggur. Kheyragurh,	9 9 1¼	0 0 19¼	4 0 0	5 9 1¼	0 0 0	15 drain bridges constructed.	Agra to Seolajat About four miles metalled. This road is under the superintendence of the Executive Engineer, Agra and Bombay Road. It is now in process of being raised and metalled.

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles. Pergunnah.	Length in Miles. Length in miles.	Length in Miles. Total length in miles.	Description of present condition of Road. Metalled.	Description of present condition of Road. Aligned and regularly made.	Description of present condition of Road. Mere hackery track.	Description of present condition of Road. Bridged or not, and if not, how many known to be wanting.	Remarks.
6	II.	1	Agra to Bhurtpoor, *viâ* Futtehpore Seekree.	*Viâ* Pitholee, Mindhakoor, Pergunnah Huzoor Tehseel and Kerowlee; Futtehpoor to the district boundary at Chowmoha Shahpoor.	Huzoor Tehseel	13	0	3½	9½	0	16 drain bridges constructed. No more required.	About three and a half miles metalled out of the station of Agra. This road is that by which travellers, and the camps of the Governor, &c., usually travel *en route* to Bhurtpoor, visiting first Futtehpoor Seekree. It is also the high road (as far as Futtehpoor) for troops and travellers marching towards Nusseerabad and Jeypoor, &c. Cotton and some sugar is also brought along this road,—the first *from* Jeypoor, the second *to* Jeypoor, Kerowlee, &c.
					Futtehpoor,	15	28	0	15	0		
7	II.	2	Futtehpore to Nusseerabad.	*Viâ* Mundvee Mirza Khan to the district boundary in Mouzah Serowlee.	Futtehpoor,	7	7	1½	1½	4	2 drain bridges are required,—one at Mundvee MirzaKhan, and one at Byragee-ka-Asthul,	Aligned and regularly made for about three miles out of Futtehpoor Seekree, after which it degenerates into a hackery track; about one-half mile is metalled in the bazaar of Futtehpoor. This road is in bad order. It enters this district in the neighbourhood of the Ootunghun, where it

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											where the Serowlee Canal branches off.	is very heavy from sand; for about two miles west of Futtehpoor Seekree it was covered with large stone fragments from the neighbouring hills, by order of my predecessor; these have not bound together, and make the road almost worse than before. This road joins No. 6 at Futtehpoor Seekree.
8	II.	3	Agra to Jugneyr, and thence to the stone quarries at Tantpoor, &c.	*Viâ* Mulpoorah, Akola, in Pergunnah Huzoor Tehseel, and Kagarole and Nugla Doola Khan and Jugneyr to Tantpoor.	Huzoor Tehseel. Kheyragurh,	13 31	0 44	4¼ 0	8¾ 31	0 0	27 drain bridges constructed, and 23 ditto wanting to complete the number required.	Four and a quarter miles metalled out of the station of Agra, leading past the artillery practice ground. All the stone quarried at Tantpoor, Busseye, &c., is brought in along this road, which is also the line along which the treasure collections of Pergunnah Kheyragurh are brought into Agra. There is much sand along this road, which is very heavy in consequence. It is intersected by the Kharee Nuddee at Akola, and by the Ootunghun river in the lands of Attah, both of which streams run violently in the rains, and are crossed by boats or ghurneves.
9	II.	4	Agra to Etawah,	*Viâ* Bumrowlee, Koondole, Futtehabad, Urnota, Bhudrowlee, and Bah, &c., to the mart and ghât of Kachoura, the	Huzoor Tehseel. Futehabad,... Bah Pinnahut.	9 18 30	0 0 57	2 0 0	7 18 30	0 0 0	20 drain bridges constructed.	Two miles metalled, as far as the gate of the Taj enclosure. This is an excellent kutcha road, constructed by Mr. Wm. Wright, Customs Patrol, under the orders of my predecessor, Mr. C. C. Jackson. It is interrupted by

General	Class.	Number of Class.	Name of Road.	Line of road, mentioning chief intermediate places.	Length in Miles. — Pergunnah.	Length in Miles. — Length in miles.	Length in Miles. — Total length in miles.	Description of present condition of Road. — Metalled.	Description of present condition of Road. — Aligned and regularly made.	Description of present condition of Road. — Mere hackery track.	Description of present condition of Road. — Bridged, or not; and if not, how many known to be wanting.	Remarks.
				boundary of the district.								the Ootunghun River, which is passed with difficulty by boat during flood in the rains. It is now generally in good order, though the first part from the 5th to the 11th milestone, requires to be carefully re-made in the next rains: *vide* my memorandum submitted to the Road Committee on the 19th of December last. This is an admirable and important line of road, and leads to four of the chief towns of the district.—*viz.*, Futtehabad, Pinnahut, Bah, and Kachoura.
10	II.	5	Agra to Shumshabad, and towards Rajah Kheyra, in Dholepoor.	*Viâ* Digneyr, &c.,	Huzoor Tehseel.	7	0	0	0	0	4 drain bridges constructed, and six bridges wanting to complete.	This road is aligned up to Shumshabad. It would be well to continue it, when there are funds enough, onward from Shumshabad through the ravines of the Ootunghun River towards Rajah Kheyra a mart of some importance in Dholepoor. The Dhole-
					Eradutnuggur.	6	13	0	13	0		

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											poor authorities should be moved to complete the road then through their territory from the Ootunghun to Rajah Kheyra.
11	II.	6	Agra to Eradutnuggur.	*Viâ* Nugla Patum and Deoree.	Huzoor Tehseel.	6	0	0	0	0	Three drain bridges are required to be built on this road.	From Agra to Karounda, about eight miles have been constructed, of which six are in Pergunnah Huzoor Tehseel, and two in Eradutnuggur—a small intervening piece, measuring five or six chains, remaining unfinished between the two, and six miles incomplete on the Eradutnuggur side. When the funds permit, this road might be completed.
					Eradutnuggur.	8	14	0	8	6		
12	II.	7	Agra to Juleysur, and towards Khass Gunge and Bareilly.	*Viâ* Nuraich, Nadow and Anwul Kheyra, the boundary of the district.	Huzoor Tehseel, included in Mynpoory Road.						Not yet bridged. 11 drain bridges are required, two of considerable size over the Jhirna nullah.	At present this is the direct road leading from Agra towards Bareilly. It will cease to be so. however, when the new Bareilly road projected by the late Lieutenant-Governor is completed, which leaves the Mynpoory trunk road at Etmadpore, and runs through Etah. This present road branches off from the Allygurh trunk road at the third milestone, near Narayeeh. A new line of road having been determined upon, it appears unnecessary; with more important works on hand, to attempt to bridge this line.
					Khundowly,	10	10	0	10	0		
13	II.	8	Bah, towards Bhurrapoora, in Etawah.	*Viâ* Jeythpore, Kullan Gurheea, Purtabpore to Oodeypore, the Bah	Bah, ...	9½	9½	0	9½	0	Drain bridges are not required on this road.	This road branches from road No. 9, between the 45th & 46th miles in the lands of Natoly. The Custom line runs along this road.

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of road, mentioning chief intermediate places.	Length in Miles. Pergunnah.	Length in miles.	Total length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere hackery track.	Bridged, or not; and if not, how many known to be wanting.	Remarks.
				boundary of this district.								
14	III.	1	Khagarole to Kheyragurh.	*Viâ* Cheet, Bhelaolee, and Khanpore.	Kheyragurh,	6	6	0	6	0	10 drain bridges are required.	This road has been aligned and regularly made from Khagarole, where it branches from No. 8, the Jugneyr Road, to the Tehseeldaree station of Kheyragurh, a distance of six miles. It has facilitated the transport of treasure, and benefitted the rising qusbah of Kheyragurh.
15	III.	2	Etmadpore towards Muttra, *viâ* Khundowly.	*Viâ* Agwar Khundowly to the boundary of the Zillah.	Khundowly,	12¾	12¾	0	11¾	1	15 drain bridges are required; one over the Jhirna nullah of large size.	This road is much traversed on the occasion of the fair at Buldeojee, in Zillah Muttra, when thousands of persons travel along it who have come by the trunk road from Etawah and the eastward. It is aligned and made from Etmadpore to Khundowly, beyond which it is a hackery track.
16	III.	3	Shumshabad to Futtehabad.	*Viâ* Dhunsirree, ...	Eradutnuggur.	1¾	0	0	0	0	5 drain bridges constructed.	A district road of much public convenience. It is aligned and regularly made throughout;
					Futtehabad,..	10	11¾	0	11¾	0		

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												since its construction, the Customs line has been placed along it.
17	III.	4	Agra to Khundowly, on the Allygurh road *viâ* Poyeah Ghat.	*Viâ* Poyeah Ghat, Mulhoopore.	Huzoor Tehseel. Khundowly,	5 4	0 9	0 0	0 9	0 0	Bridged.	This road runs from the Civil Lines of Agra, and, crossing the Jumna at the Poyeah Ghât, joins the Allygurh trunk road at Khundowly. It shortens the distance to the residents of the Civil Lines, but, no bridge being kept up over the Jumna, is little used. It is regularly aligned and made.
18	III.	5	Poyeah Ghat to Bugur Bhoosa, on the trunk road to Khundowly and Allygurh.	... ...	Khundowly,	1½	1½	0	1½	0	4 Drain bridges are required.	This is a short piece of road, connecting the Poyeah Ghat with the Allygurh trunk road at Bugur Bhoosa. It is not much used.
19	III.	6	Futtehabad to Ferozabad.	*Viâ* Bhurrapoor, Mohummudpoor, to Ferozabad.	Futtehabad, Ferozabad,	1½ 10	0 11½	0 0	0 11½	0 0	1 Drain bridge is required.	A cross-road, of much utility in facilitating the passage of travellers from one town to the other. It is carried from Futtehabad directly to the ravines, and threads them, crosses the Jumna at the Bhurrapoor ferry, and leads through a great extent of broken ravine ground to the trunk road (Mynpoory) at Ferozabad.
20	III.	7	Gwalior, *viâ* Kynjra Ghat towards the mart of Sursagunj and Mynpoory, *viâ* Bikrumpore Ghat.	*Viâ* Dyruck, Bejowlee, Bah, to Bikrumpore, the boundary of the district.	Bah Pinnahut.	10	10	0	10	0	1 Drain bridge constructed; one ditto wanting.	Travellers and light merchandize coming from Gwalior and going to Mynpoory, or to the mart of Sursagunj, traverse this road. The Chumbul river is crossed at the ferry of Kynjra, whence the road threads the ravines to the

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Pergunnah.	Length in Miles. Length in miles.	Total length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	Remarks.
												upland, passes through the town of Bah, and leads straight through the Jumna ravines to the ferry at Bikrampore on that river.
21	III.	8	Bah to Buteysur, and to the Narungee Bah ferry.	*Viâ* Kheyra Deybeedoss.	Pinnahut, ...	7½	7½	0	5	2½	No bridge required.	There is a very large fair held annually at Buteysur, at the full moon of Kartick (generally in November). Horses and cattle are brought from great distances. This road was constructed for the accommodation of parties visiting the fair from the direction of Gwalior, Etawah, &c., by way of Bah, and the road is continued to the ferry over the Jumna at Narungee Bah by a hackery track.
22	III.	9	Furrehrah to Buteysur.	*Viâ* Ghunpoora, ...	Pinnahut, ...	4	4	0	4	0	Ditto, ...	Ditto ditto. Parties coming from Agra and Pinnahut come this way; the road branches from No. 9 (the Etawah road) at the 38¼ mile.
23	III.	10	Pinnahut, by Papreenuggur, to-	*Viâ* Bipraolee and Kurkolee.	Pinnahut, ...	7	7	0	7	0	2 Bridges wanted.	Made to connect Pinnahut with the market at Rajah Kheyra;

			wards Rajah Kheyra, in the Dholepoor territory.								it has been completed to the British frontier, and the Dholepoor authorities have promised to carry it on quickly to Rajah Kheyra.
24	III.	11	Pinnahut to Bhudrolee, on the Etawah Road, No. 9.	*Viâ* Urjoonpoora and Kookthurree.	Pinnahut, ...	6	6	0	6	0	No bridge required.	All the cotton from Rajah Kheyra and that which crosses from the Gwalior territories by Raj Ghât to Pinnahut, *en route* to the marts of Bah and Kuchowra, traverses this road.
25	III.	12	Pinnahut to Arnowts, on the Agra and Etawah road, No. 9.	*Viâ* Lurooapoor and Muhapoor.	Pinnahut, ...	5	5	0	5	0	1 bridge constructed; one required.	The direct line from Pinnahut leading towards Agra.
26	III.	13	Furrah towards Deeg and Sone.	*Viâ* Sumoura, Bhaee, and Sirsa.	Furrah, ...	10	10	0	10	0	8 bridges required.	The salt trade from Deeg in Bhurtpore, and Sone in Zillah Muttra, passes by this road, and joins the high road from Muttra to Agra, No. 3, at Furrah.
27	III.	14	Customs line road south of Futtehabad.	...	Futtehabad,	1	1	0	1	0	No bridge required.	This is a short cross road constructed south-west of, and near the town of, Futtehabad, to unite the Customs line on the Shumshabad road, No. 10, with the line on the Etawah road, No. 9. Before the construction of this road, the Customs line passed through the outskirts of the town, to the great inconvenience of the towns-people.
28	III.	15	Ferozabad to Juleysur.	*Viâ* Puchwa and Buchgawa to the boundary of the district at Katkee.	Ferozabad, ...	13	13	0	10	3	9 bridges required.	This is a cross road to unite the towns of Juleysur in Zillah Muttra, and Ferozabad in Agra. It has been aligned, and made for

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles. Pergunnah.	Length in miles.	Total length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	Remarks.
												a length of ten miles in this district; three miles remain to be made and should be constructed in May and June next, when the fields are clear, and no compensation will be required to be paid for crops. The Muttra road Committee were moved, by my letter No. 9, dated the 10th of November last, to complete this road within that district.
29	III.	16	Furrah to Wyra, on the by-road towards Muttra.	*Viâ* Shahpore, Jhundeepore, to the boundary of Wyra.	Furrah, ...	5	5	0	5	0	2 bridges required.	There are two roads from Furrah to Muttra; the first is the high road (No. 3), and is metalled, following the bangur or high land. This is the second, and is straighter a good deal, and preferred in the hot winds, because leading near the river. It passes through the ravines, and over much low khadur land; so that in the floods, during the rainy season, it is often impassable. This road has been aligned

												and made to the boundary of the Muttra District, where it descends into the khadur.
30	III.	17	Shahgunj to the Muttra road, (No. 3).	*Viâ* Bodla, Déhtora, Mohummudpoor, to the junction with the Muttra road.	Huzoor Tehseel.	5½	5½	0	5½	0	Bridged.	A straight cut to the high Muttra road (No. 3), leading from the direction of the Military Cantonment and Shahgunj. It joins the Muttra high road near the Hurbola chowkee and the 8th mile stone. A road branches off from this to Secundra from near Bodla.
31	III.	18	Futtehpore Surheyndee towards Dholepoor.	*Viâ* Doolhara, Mogowlee Kullan, aud Surheyndee.	Futtehpore, Kheyragurh,	5 6½	0 11½	0 0	0 0	0 11½	...	A cross-road travelled by foot passengers, and also sometimes by money-carriers mounted on camels from Rajpootana, going towards Dholepore and Gwalior. The road passes through an intervening strip of the Bhurtpore territory.
32	III.	19	Futtehpore Seecree towards Muttra.	*Viâ* Dowlutabad, Arnotah Khas, Sunowrah, Bhaee, and joins the high metalled road to Muttra.	Futtehpore, Furrah, ...	3 16½	0 19½	0 0	0 0	0 19½	Not yet bridged.	A direct cross-road to Muttra from Futtehpore Seecree; nothing has yet been done to align or otherwise improve it. Stone from the quarries at Tantpoor is brought along the roads Nos. 53 and 31 to Futtehpore, and thence by this road towards Muttra. Stone is also conveyed by No. 47 road towards Muttra, joining the high road at Furrah.
33	III.	20	Eradutnuggur to Kheyragurh.	*Viâ* Rehlye, Syeean, Jajow, and Busseye.	Eradutnuggur. Surheyndee,	7 5	0 12	0 0	0 0	0 12	Ditto.	This is now only a hackery track, and a very indirect one, in the Eradutnuggur Pergunnah, in which the road makes a detour

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General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles. Pergunnah.	Length in miles.	Total length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	Remarks.
												by Rehlye, to avoid some intervening low land on the direct line. It joins the high Gwalior road at Syeean, follows it to Jajow, and leaves it again there towards Kheyragurh. A new direct aligned road ought to be constructed from Syeean to Eradutnuggur so soon as the state of the funds permit.
34	III.	21	Kuchowra to Jhumsara Ghât.	*Viâ* Kookapoor and Gurheea Purtappoor.	Pinnahut, ...	9	9	0	0	9	Not yet bridged.	This road unites the market town of Kuchowra on the Jumna with the Jhumsara ghât on the Chumbul, and is the line of communication from the bordering Gwalior territory with the mart of Kuchowra. From the ghât to Gurheea Purtappoor on the Bhurreypoora road (No. 13), it runs through the Chumbul ravines, and cannot be made passable for wheeled conveyances. From Gurheea Purtappoor to Kuchowra, there is nothing to

											prevent the road being aligned and made; and this should be done, if only to facilitate the communication of the Customs Patrol, stationed at Gurheea Purtappoor with Kuchowra, and of the district authorities, when visiting the pergunnah. Its construction has recently been passed by the Committee.
35	III.	22	Bah to Mhowa Ghât.	*Viâ* Chourungahar and Seyrmow.	Pinnahut, ...	7	7	0	0	7	Ditto, ...	Next to Kynjra ghat, this is the direct road from Bah to the town of Atteyr, &c., in Gwalior, and is the most frequented on the Chumbul. It were well to align this road when funds permit, to the beginning of the ravines, among which the road winds, and where it will need yearly repair.
36	III.	23	Eradutnuggur to Shumshabad.	*Viâ* Tore, Loharee,	Eradutnuggur.	5	5	0	0	5	Ditto, ...	A cross road of communication which should be aligned and regularly made when funds permit, whereby the direct communication from the high Gwalior road (No. 5) at Syeean and the high Etawah road (No. 9) at Futtehabad will be completed.
37	III.	24	Futtehabad to Rajah Kheyra in Dholepoor.	*Viâ* Mooseypoor, Rampoor, to Dhanola.	Futtehabad,	9	9	0	0	9	Ditto, ...	Leading from the town of Futtehabad to the market of Rajah Kheyra in Dholepoor. It should be aligned and made, when funds permit, to the ravines of the Ootunghun, and the Dholepoor authorities moved to carry it on thence to Rajah Kheyra.

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General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles.			Description of present condition of Road.				Remarks.
					Pergunnah.	Length in miles.	Total length in miles.	Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	
38	III.	25	Ferozabad by Kotla towards the mart of Phureyha.	*Viâ* Guneh and Kotla.	Ferozabad,...	12	12	0	0	12	Not yet bridged.	A cross road leading from the town of Ferozabad to the large village of Kotla and the market town of Phureyha, in Mynpoory. Is crossed by the Seyngur Nuddee near Guneh. It should be aligned when funds permit.
39	III.	26	Phureyha in Zillah Mynpoory towards Agra by Etmadpoor.	*Viâ* Gangnee, Narkee, Himmutpoor, and Katkee.	Ferozabad,... Khundowly,	8½ 9½	0 18	0 0	0 0	0 18	Ditto, ...	This road is a good deal traversed, and has been recently examined and surveyed, with the idea of making a straight alignment from the Mynpoory trunk road (No. 1) at Etmadpoor, by the thannah of Narkee to Phureyha mart; but it had better be deferred until the new road ordered by Government from Etmadpoor towards Bareilly *viâ* Eytah has been laid down. A branch road from it to Phureyha will then be sufficient.

40	III.	27	Etmadpoor by Kotla towards Shekoabad.	*Viâ* Jarkee, ...	Ferozabad, ... Khundowly,	8 5	0 13	0 0	0 0	0 13	Ditto, ...	A cross road a good deal traversed, to which as yet nothing has been done. See remarks to No. 39. Nothing can be undertaken to improve this road until the new main line to Eytah has been laid down.
41	III.	28	Ferozabad to Buteysur and Bah.	*Viâ* Mutseyna and Datowlee.	Ferozabad, ...	12	12	0	0	12	Ditto, ...	A direct road from Ferozabad towards Buteysur in Bah Pinnahut, much travelled during the Fair. It is not of much importance, but when funds permit it might be aligned, and must then be carried through the intervening portion of the Mynpoory zillah.
42	III.	29	Narkee towards Shekoabad *viâ* Kotela.	*Viâ* Kotela, ...	Ferozabad, ...	5½	5½	0	0	5½	Ditto, ...	See remarks to No. 39. This road will certainly be required when the new Eytah line has been made.
43	III.	30	Futtehpoor by Khyragurh, towards Dholepoor and Gwalior.	*Viâ* Doora, Deoreyta and Burwur.	Futtehpore, Khyragurh,	8 8	0 16	0 0	0 0	0 16	Ditto, ...	Persons travelling from Gwalior to Futtehpore Seecree would come by this road, either direct from Dholepoor to Khyragurh *viâ* Kytholee, or round by Jajow. It is already sufficiently straight, but, when funds permit, should be aligned and regularly made. It is already naturally a good road, the soil being hard, and no obstacles.

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road, mentioning chief intermediate places.	Length in Miles.			Description of present condition of Road.				Remarks.
					Pergunnah.	Length in miles.	Total length in miles.	Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	
44	IV.	1	Qusbah Bah to Nundgawan.	*Viâ* Chourungahar and Oodeypoor.	Pinnahut, ...	9	9	0	0	9	Not yet bridged.	A road from the town of Bah to the ghat of Nundgawan on the river Chumbul, leading into Gwalior; might be aligned and made when funds permit.
45	IV.	2	Bullaee Ghat to Pinnahut.	*Viâ* Ratowlee and Hoseynpore.	Pinnahut, ...	10	10	0	0	10	Ditto, ...	Considerable cross traffic on buffaloes, bullocks, &c., passes along this road from the North-East by the Bullaee Ghat on the Jumna into Gwalior by the Raj Ghat on the Chumbul at Pinnahut. It might be aligned and made, when funds permit, with advantage.
46	IV.	3	Rajowra Ghat by Ruhlolee towards Pinnahut.	... ...	Ditto, ...	3	3	0	0	3	Ditto, ...	A short road joining the preceding one from the neighbouring ghat of Rajowra, on the Jumna. The same remarks apply.

47	IV.	4	From Kheyragurh, &c., by way of Kerowlee and Furrah towards Muttra.	*Viâ* Jeingara and Kerowlee, Pergunnah Futtehpoor Seecree, and Achneyra Behrod, &c., to the Muttra high road at Furrah.	Kheyragurh, Futtehpore, Furrah, ...	5 11 11½	0 0 27½	0 0 0	0 0 0	0 0 27½	Ditto, ...	By this road is a direct communication towards Muttra both from Kheyragurh, and also from the stone quarries of Tantpoor, &c., the carts from which come along the main road from Jugneyr towards Agra (No. 8), and then turn off towards Jeingara before reaching Khagarole. It might be aligned and regularly made when the funds are sufficient.
48	IV.	5	Jugneyr by way of Ghutoly, Konreye, and Achneyra towards Muttra.	*Viâ* Ghutoly, Jajow, Konreye and Achneyra.	Kheyragurh, Futtehpore, Furrah, ...	9 9½ 2½	0 0 21	0 0 0	0 0 0	0 0 21	Ditto, ...	This is the road chiefly traversed by stone carts from the quarries beyond Jugneyr to Muttra. It crosses a strip of the Bhurtpore territory between the Pergunnahs of Kheyragurh and Futtehpore, and joins the road to Muttra, No. 47, at Achneyra, in Pergunnah Furrah.
49	IV.	6	Ferozabad to Narkee.	*Viâ* Jusrutpoor, ...	Ferozabad, ...	9½	9½	0	0	9½	Ditto, ...	A cross road from Ferozabad to the Narkee thannah not much traversed, but useful, particularly as facilitating public intercourse and duty. When there are sufficient funds it might be aligned and made.
50	IV.	7	Ferozabad to Futtehabad.	*Viâ* Puharpoor, Futtehpore, Anundipoor and Sowara.	Ferozabad, ... Futtehabad,	7 8	0 15	0 0	0 0	0 15	Ditto, ...	A circuitous cross road leading from Ferozabad to Futtehabad, by way of Anundipoor and the

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road mentioning chief intermediate places.	Length in Miles.			Description of present condition of Road.				Remarks.
					Pergunnah.	Length in miles.	Total length in miles.	Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not; and if not, how many known to be wanting.	
												Sowara Ghat. It is a mere hackery track, and may be allowed to remain so, being only used by the inhabitants of villages adjacent to it.
51	IV	8	Etmadpoor, *viâ* Googur, Sooreyra to Tajgunj.	*Viâ* Sooreyra Ghat, Tunnowra, Noorpoor, Sumogurh to Tajgunj.	Khundowlee, Futtehabad, Huzoor Tehseel.	3 6 4	0 0 13	0 0 0	0 0 0	0 0 13	Not yet bridged.	This is also a circuitous road from Etmadpoor. on the Mynpoory Trunk Road to Tajgunj, crossing the Jumna at the Sooreyra Ghat. It is used only by bullock and donkey drovers, and is a mere track. It does not require regular alignment or making.
52	IV.	9	Kheyragurh to Surheyndee.	*Viâ* Nugla Dooley-khan.	Kheyragurh,	9½	9½	0	0	9½	Ditto, ...	A cross road, very sandy, and intercepted by the Ootunghun; might hereafter be aligned with advantage.
53	IV.	10	Futtehpore to Khagarole.	*Viâ* Jajow, Beywun, and Buha.	Futtehpore, Kheyragurh,	9½ 2	0 11½	0 0	0 0	0 11½	Not bridged.	A cross road, chiefly used by the villagers and country people. Nothing has yet been done to

											improve it. Neither need anything, I think, be done.
54	IV.	11	Khagarole, by way of Kerowlee towards Furrah.	*Viâ* Kerara and Kheyreea.	Kheyragurh, Futtehpore,	1¾ 8¼	0 10	0 0	0 0	0 10	Ditto, ... A cross road, chiefly traversed by stone-carrier carts, whose owners reside near Khagarole, a village on the Jugneyr stone road (No. 8), going with stone towards Furrah and Muttra. When funds permit, it might be aligned and cheaply made.
55	IV.	12	Old road from Agra to Muttra, running along the Jumna ravines.	*Viâ* Gowghaut and Choormoora, and joining the Weyr road (No. 29), at Shahpoor.	Furrah, ...	10½	10½	0	0	10½	Ditto, ... This was the original high road to Muttra, but is now almost quite abandoned, in consequence of the construction of the new metalled high road, which is clear of the ravines. It is somewhat shorter than the new road, and foot passengers and horsemen, and occasionally a bylhee, and money-carriers sometimes frequent it. So far from repairing this road, I would do all that is possible to discountenance its use, for it is impossible to guard it and the new high road also, and the broken ground through which it passes renders it dangerous.
56	IV.	13	Agra to Furrah *viâ* Bubrode.	*Viâ* Bodla, Punwaree, Khundweye, and Kasowthee.	Huzoor Tehseel. Furrah, ...	8 7½	0 15½	0 0	0 0	0 15½	Ditto, ... A cross road, leading to Furrah by a circuit, but chiefly used for communication with th villages

General No. of Road.	Class.	Number of Class.	Name of Road.	Line of Road mentioning chief intermediate places.	Length in Miles.			Description of present condition of Road.				Remarks.
					Pergunnah.	Length in miles.	Total length in miles.	Metalled.	Aligned and regularly made.	Mere Hackery track.	Bridged or not, and if not, how many known to be wanting.	
												about Bubrode and Jhundaweye. It might be aligned and made cheaply, with advantage, when funds permit, and all more necessary roads have been completed.
57	IV.	14	Eradutnuggur to Dholepoor.	*Viâ* Muhaoo and Ladookheyra.	Eradutnuggur.	6½	6½	0	0	6½	Not bridged.	A cross road, not much frequented, leading towards Dholepoor. At present it does not seem necessary to do anything to improve it by alignment.

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Pergunnahwar Statement of Roads in the Agra District.

Pergunnah.	Number.	Name of Road.	Length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere Hackery tracks.	Bridged; if not, how many known to be wanting.
Huzoor Tehseel.	1	Agra to Mynpoory, ...	1	1	0	0	Bridged.
	2	Ditto to Allygurh, included in the Mynpoory road.					
	3	Ditto to Muttra, ...	9	9	0	0	Ditto.
	4	Ditto to Bhurtpoor, ...	12	4	8	0	Ditto.
	5	Ditto to Gwalior, ...	9	4	5	0	Ditto.
	6	Ditto to Bhurtpoor, *viâ* Futtehpore, ...	13	3½	9½	0	Ditto.
	8	Ditto to Jugneyr, and thence to Tantpoor, ...	13	4¼	8¾	0	Ditto.
	9	Ditto to Etawah, ...	9	2	7	0	Ditto.
	10	Ditto to Shumshabad, ...	7	0	7	0	Two wanting, and one constructed.
	11	Ditto to Eradutnuggur, ...	6	0	6	0	Six wanting.
	12	Ditto to Juleysur, *viâ* Nuraich and Anwal Kheyra, included in the Allygurh road, ...	0	0	0	0	Eleven wanting.
	17	Ditto to Khundowly, on the Allygurh road, *viâ* Poeyah Ghat,	5	0	5	0	Bridged.
	30	Shahgunj to Muttra road, *viâ* Bodla, ...	5½	0	5½	0	Ditto.
	51	Etmadpoor to Tajgunj, ...	4	0	0	4	
	56	Agra to Furrah, *viâ* Bubrode, ...	8	0	0	8	
	15		101½	27¾	61¾	12	
Eradutnuggur.	5	Agra to Gwalior, ...	9	0	9	0	Bridged.
	10	Ditto to Sumshabad, ...	6	0	6	0	Four constructed, and four wanting.
	11	Ditto to Eradutnuggur, ...	8	0	2	6	Three wanting.
	16	Shumshabad to Futtehabad, ...	1¾	0	1¾	0	Bridged.
	33	Eradutnuggur to Kheyragurh, ...	7	0	0	7	
	36	Ditto to Shumshabad, ...	5	0	0	5	
	57	Ditto towards Dholepoor, ...	6½	0	0	6½	
	7		43¼	0	18¾	24½	

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Pergunnahwár Statement of Roads in the Agra District.—(Contd.)

Pergunnah.	Number.	Name of Road.	Length in miles.	Description of present condition of Road. Metalled.	Aligned and regularly made.	Mere Hackery tracks.	Bridged; if not, how many known to be wanting.
Bah Pinnahut.	9	Agra to Etawah, ...	30	0	30	0	Bridged.
	13	Bah to Bhurrapoor in Zillah Etawah, ...	9¼	0	9¼	0	None needed.
	20	Gwalior, *viâ* Kynjra Ghat, towards the mart of Sirsagunj and Mynpoory, *viâ* Bikrumpoor Ghat, ...	10	0	10	0	One wanting.
	21	Bah to Buteysur, and to the Narengee Bah Ferry, ...	7½	0	5	2½	None needed.
	22	Furreyra to Buteysur, ...	4	0	4	0	Ditto.
	23	Pinnahut to Papreenuggur, ...	7	0	7	0	Two wanting.
	24	Pinnahut to Bhudrolee on the Etawah road, No. 9, ...	6	0	6	0	None needed.
	25	Pinnahut to Arnota, in the Agra and Etawah road, No. 9, ...	5	0	5	0	One constructed, and one wanting.
	34	Kuchora to Junsura Ghat, ...	9	0	0	9	
	35	Bah to Mhowah, ...	7	0	0	7	
	44	Ditto to Nudgawan, ...	9	0	0	9	
	45	Bullaee Ghat to Pinnahut, ...	10	0	0	10	
	46	Rajara Ghat by Rehtolee towards Pinnahut, ...	3	0	0	3	
	13		116¾	0	76¼	40½	
Surheyndee.	5	Agra to Gwalior, ...	1¼	0	1¼	0	Bridged.
	8	Ditto to Jugneyr, and thence to the stone quarries at Tantpoor,	31	0	31	0	Twenty-three wanting.
	14	Kagarole to Kheyragurh, ...	6	0	6	0	Ten ditto.
	31	Futtehpoor to Surheyndee towards Dholepoor, ...	6¼	0	0	6¼	
	33	Eradutnuggur to Kheyragurh, ...	5	0	0	5	
	43	Futtehpore by Kheyragurh towards Dholepoor and Gwalior,	8	0	0	8	
	47	Kheyragurh, &c., by Kerowlee and Furrah to Muttra, ...	5	0	0	5	
	48	Jugneyr by way of Ghutoly, Konreye and, Achneyra, towards Muttra, ...	9	0	0	9	
	52	Kheyragurh to Surheyndee, ...	9½	0	0	9½	
	53	Futtehpore to Kagarole, ...	2	0	0	2	
	54	Kagarole by way of Kerowlee towards Furrah, ...	1¾	0	0	1¾	
	11		84¾	0	38¼	46½	

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Pergunnahwar Statement of Roads in the Agra District.—(Contd.)

Pergunnah.	Number.	Name of Road.	Length in miles.	Description of present condition of Road.			
				Metalled.	Aligned and regularly made.	Mere hackery tracks.	Bridged; if not, how many known to be wanting.
Futtehpore Seekree.	6	Agra to Bhurtpore, *viâ* Futtehpore, ...	15	0	15	0	Bridged.
	7	Futtehpore to Nusseerabad, *viâ* Munduee Mirza Khan, ...	7	1½	1½	4	Two wanting.
	31	Futtehpore to Surheyndee, ...	5	0	0	5	
	32	Futtehpore to Muttra, ...	3	0	0	3	
	43	Ditto to Kheyragurh, ...	8	0	0	8	
	47	From Kheyragurh by way of Kerowlee and Furrah towards Muttra, ...	11	0	0	11	
	48	Jugneyr by way of Ghutoly, Kerowlee and Achneyra towards Muttra, ...	9½	0	0	9½	
	53	Futtehpore to Kagarole, ...	9½	0	0	9½	
	54	Kagarole by way of Kerowlee towards Furrah, ...	8¼	0	0	8¼	
	9		76¼	1½	16½	58¼	
Furrah.	3	Agra to Muttra, ...	17	17	0	0	Bridged.
	4	Do. to Bhurtpoor *viâ* Achneyra,	9	0	9	0	Ditto.
	26	Furrah to Deig and Sone, ...	10	0	10	0	Eight wanting.
	29	Ditto to Wyra on the road towards Muttra, ...	5	0	5	0	Two ditto.
	32	Futtehpore to Muttra, ...	16½	0	0	16½	
	47	Kheyragurh by way of Kerowlee and Furrah towards Muttra,	11½	0	0	11½	
	55	Old road from Agra to Muttra running along the Jumna ravines, ...	10½	0	0	10½	
	56	Agra to Furrah, *viâ*, Bubrode,...	7½	0	0	7½	
	8		87	17	24	46	
Ferozabad.	1	Agra to Mynpoory, ...	12	12	0	0	Bridged.
	19	Futtehabad to Ferozabad, ...	10	0	10	0	None needed.
	28	Ferozabad to Juleysur, ...	13	0	10	3	Nine wanting.
	38	Ferozabad to Kotla, ...	12	0	0	12	
	39	Phureyra in Zillah Mynpoory towards Agra by Etmadpoor, ...	8½	0	0	8½	
	40	Etmadpoor to Kotla, ...	8	0	0	8	
	41	Ferozabad to Buteysur and Bah,	12	0	0	12	
	42	Narkee to Shekoabad, ...	5½	0	0	5½	
	49	Ferozabad to Narkee, ...	9½	0	0	9½	
	50	Ditto to Futtehabad, ...	7	0	0	7	
	10		97½	12	20	65½	

Pergunnahwar Statement of Roads in the Agra District.—(Concld.)

Pergunnah.	Number.	Name of Road.	Length in miles.	Description of present condition of Road.			
				Metalled.	Aligned and regularly made.	Mere hackery tracks.	Bridged; if not, how many known to be wanting.
Futtehabad.	9	Agra to Etawah, ...	18	0	18	0	Bridged.
	16	Shumshabad to Futtehabad, ...	10	0	10	0	
	19	Futtehabad to Ferozabad, *viâ* Ghat Bhurrapoor, ...	1½	0	1½	0	None needed.
	27	Custom line road south of Futtehabad, ...	1	0	1	0	Ditto.
	37	Futtehabad to Kajakheyra, ...	9	0	0	9	
	50	Ferozabad to Futtehabad, ...	8	0	0	8	
	51	Etmadpoor to Goojar Sooreyra to Tajgunge, ...	6	0	0	6	
	7		53½	0	30½	23	
Khundowly.	1	Agra to Mynpoory, ...	19	19	0	0	Bridged.
	2	Ditto to Allygurh, ...	10	10	0	0	Ditto.
	12	Ditto to Juleysur, *viâ* Nuraich and Anwul Kheyra, ...	10	0	10	0	Eleven wanting
	15	Etmadpoor to Muttra, ...	12¾	0	11¾	1	Fifteen ditto.
	17	Agra *viâ* Poeyah Ghat towards Allygurh, ...	4	0	4	0	Bridged.
	18	Poeyah Ghat to Bugurbhoosa on the trunk road to Khundowly and Allygurh road, ...	1½	0	1½	0	Four wanting.
	39	Phureyha, in Zillah Mynpoory, towards Agra by Etmadpoor,	9½	0	0	9½	
	40	Etmadpoor to Kotla, ...	5	0	0	5	
	51	Ditto by Goojur Sooreyra to Tajgunge, ...	3	0	0	3	
	9		74¾	29	27¼	18½	
		Grand Total, ...	735¼	87¼	313¼	334¾	

No. 11.

ON THE ROADS IN THE AZIMGURH DISTRICT.

MINUTE *on the Roads in the Azimgurh District, by* E. A. READE, ESQ., *Commissioner of the 5th Division, dated Camp Mhow, the 6th December, 1851.*

I TRUST it will be of use to put on record some observations founded on local knowledge of this district, and experience for several years obtained in the adjoining district of Goruckpore.

2.—It is necessary for the Committee to bear in mind the peculiar geographical position of Zillah Azimgurh, crossed by thoroughfares from Allahabad, Benares and Ghazeepore, and by lines from the markets on the Ganges to the Gogra. It has, in consequence, with reference to its area and its funds, a longer extent of connecting lines, probably, than any other district in the North-Western Provinces.

3.—This important peculiarity renders it imperatively necessary to decide upon the best system for keeping up, not one or two, but many thoroughfares in a state of efficiency; and this of course mainly depends on the amount of funds at the disposal of the Committee, and a suitable and systematic plan of operations.

4.—A glance at the map is quite sufficient, without reference to past experience, to show that it is utterly impossible for the Committee, with the means at their disposal, to attempt any considerable length of road, well raised above the level of the country; because, if only half of the commercial roads were thus raised and bridged, the yearly income would scarcely be sufficient for the requisite annual repairs. Vigorous efforts have been made, and a large outlay incurred, in making the principal line of the district, from Jounpore boundary to Doohree

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Ghât, a sort of Grand Trunk Road; but the cost that has been incurred, and the damages sustained, only show what large sums must be sacrificed before this single line can be completed; and the Committee has yet to learn that every work of great pretensions bequeaths to their successors a heavy annual charge for maintenance, with risk of great outlay in the event of unusual inundation.

5.—It cannot be too constantly borne in mind, that the greater the pretension of the road, the more certain the stoppage of traffic in the event of casualties, and the necessity of large outlay before it can be renewed. It sounds well to determine that a road shall be well raised, and the mere earthwork is a matter of mere expense. But then comes the necessity of multiplying bridges; and the more bridges, the greater the annual cost of timeous repairs, the greater the necessity of inspection. A road well raised is incomplete unless it be metalled; the cost is great, the supply of material is scanty, and by the time the whole line may have been metalled, the necessity may arise for renewal. If the Committee hesitate, the previous labour is lost. A metalled road in disrepair is infinitely worse than an earthen road, even if neglected. Accidents and disasters belong to the one, only difficulty and delay to the other.

6.—The Committee are now engaged in one great work, and with reference to progress made, it seems desirable to press it to completion. I allude to the line of road from the Jounpore boundary to Azimgurh, and from thence to Doohree Ghât. This is their Grand Trunk Road, and I strongly advise them not to enter on a similar experiment elsewhere.

7.—The question will naturally be asked,—what then is the best system to pursue regarding other lines? and it is the object of this minute to furnish a reply.

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8.—The first thing to be done is, to have a register made of all roads under the supervision of the Committee. I have compiled one which I doubt not will answer all purposes, and recommend the Committee to adopt it.

9.—The uses of this register are several. The Committeee can form hereby a correct estimate of the extent of their charge. It simplifies business, for the Committee will be enabled, at the general annual meeting, which should take place during the first week in September, to discuss each line *seriatim*; to resolve on non-interference, or rendering passable, or effectual repair, as the case may be, and to vote sums on estimates accordingly. It renders accounts distinct, because items of expenditure will be charged to the proper number of the road on which outlay is incurred. It facilitates reference also; every Tehseeldar should have a map, showing the line, number, and distance in miles, of each road in his jurisdiction. He and his subordinate officers can inspect, report, and superintend repairs when necessary. It prevents encroachment, for if nothing else is done to a road but to register it, the fact soon becomes known to the village land-owners and rural police. In the adjacent district, every goreyut knows the number of his road.

10.—Registration having been made and notified, the next step is for the Committee to determine which roads shall be made and repaired by hired agency under their own control, and which shall be entrusted to the Tehseeldars under the orders of the Collector and Magistrate. As a general rule, I would strongly advise both Secretary and Committee not to trust to contractors, whose work they have not the means and time for inspecting occasionally. Nos. 1 and 2 of the accompanying register, and perhaps 3, might be reserved as the Committee's, or, what is the same thing, their Secretary's special charge. For the residue,

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the charge may be as well assigned to the Tehseeldars, maps being furnished as suggested above. Of course it can be arranged at any time, that any line of road be taken up as a special charge of the Secretary, or some individual member of Committee, or any other suitable trustee.

11.—The next thing to be considered, is the principle to be observed as nearly as possible in the disposal of funds. It will be found best to consider the Ferry Funds as the means for making bridges, and to resolve on an annual saving from the Road Fund for the same purpose and metalling. This saving will vary according to circumstances, but one-fifth is, I think, the minimum that should be set apart for this purpose. It is almost needless for me to intimate that the Committee should never be induced to vote to the full amount of their means. A safe margin should always be retained to meet unexpected calls.

12.—In the accompanying register I have classified the roads to the best of my knowledge, in the order of their importance, and request the Committee will bear in mind the preliminary observations of this minute. It might at first occur to a Committee at Azimgurh, that the Doohree Ghât Road, No. 5, is hardly fit to be placed in the first class; yet it is the most important commercial line between the Ganges and the Gogra, and is noted in the Resolution of Government, dated 10th February, 1841.

13.—Of these roads, I am decidedly of opinion that only 1 and 2 can be metalled, after completion of earth-work and bridges. The Committee may be able to effect this, and, the work once done, to maintain it; but assuredly, if they attempt the same improvement on other lines, they will not only fail, but some hundreds of miles of other roads will be sacrificed in costly experiments on a few

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miles of road of not greater importance than others, for developing the resources of the district.

14.—With regard, then, to other roads, my advice is that those which belong to the first class should be effectually repaired every year; roads which belong to the second class should receive ordinary repairs annually, and effectual repairs once in three years. Roads of the third class should be inspected annually; where impassable, should be made passable, and effectual repair be left to the discretion of the Secretary. In the adjacent district of Goruckpore there are 1,952 miles of road; the Road Fund income is about Rs. 21,000, and yet I believe that it is perfectly possible to travel in a buggy through the whole extent of any and every line.

15.—The roads are of course cutcha, for there is less kunkur in that than in the Azimgurh District, and probably as much as a thousand miles of it is protected by the sod which grows firmly in a Terai district. But still there must be some 900 miles of road not thus shielded, and as the soil is even lighter than that of the Azimgurh District, there must be some reason why the roads on one side should be comparatively less heavy for vehicles than on the other. There is undoubtedly more moisture on the Goruckpore roads, but the principal reason is their great breadth. In narrow roads, a string of hackeries follows in one and the same track; the road is soon cut up, and becomes knee deep in dust; whereas on a broad road, there being treble or quadruple the accommodation, the wear and tear is more evenly distributed.

16.—In the Azimgurh District there cannot be a doubt that, during the last few years, the principal thoroughfares have been much crimped by encroachment; and the Committee, or rather the Collector and Magistrate, will have some trouble in reverting to original dimensions. Care

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should be taken not to interfere with standing crops, but the limits of the road should be marked off, after they have been removed, and the local Police held responsible that no future encroachments are made: this is a duty devolving on them by law, but one of all others regarding which they require constant remembrancers.

17.—Much of the first and second class of roads is now considerably below the level of the adjoining fields; the Committee should endeavour to make the thoroughfare even with them; greater altitude should not be attempted until there are available resources to supply the requisite number of bridges. The requisite quantity of earth to fill the hollow should not be taken from the productive superficies of fields, too often a subject of reasonable complaint, but from even trenches, about 3 feet wide, cut along the sides of the road, and separated from it by a narrow strip or border. If this trench be excavated evenly, it will be useful to the cultivator for purposes of irrigation.

18.—On every line of road there will of course be some places which, from the nature of the soil, will always be heavy and intractable; these should be made passable, and reserved for the more expensive operations of metalling with kunkur, or baked clay, when the cost can be spared.

19.—There should be a standard measure for dimensions of the several description of roads. They are 50 feet for first class, 40 feet for second class, and 24 for third class roads in the Goruckpore District; 45, 35 and 20 would perhaps be found sufficient for the Azimgurh District. In order to ensure uniformity, 10 feet poles, marked with halves and quarters, should be supplied to each Tehseeldaree. These will prevent any attempts by understrappers to play tricks. Ordinarily, if the road is less than the requisite dimension, it may be safely assumed that the agent

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has been bribed; if it be more, the cultivator of the adjacent field has refused to submit to imposition.

20.—It may be necessary, in some places, to appropriate land for new lines, to avoid sinnosities in the present line of road. The Committee must bear in mind that they have no authority to appropriate, without the sanction of Government first obtained; and it is necessary for me to state that, unless the gain by the proposed change of line is really important, the Government will not consent to the sacrifice of its revenue. For the correction of slight bends in the road, therefore, it is needless to make any recommendation.

21.—Where a new line is really necessary, it should be laid down after the crop is cut, and rent should be paid for it as a solacium for one, two, or three years, until the old line abandoned shall have become productive. Such questions are best adjusted by some European member of the Committee on the spot, cash in hand. If the old road be parcelled out amongst the cultivators of fields taken up by the new line, and both cultivator and landowner receive compensation on the spot, even in the very litigious districts of Azimgurh, the adjustment will almost always be satisfactory and conclusive. It may, however, happen that the old abandoned line and the new line are situated in different estates. In such cases, the adjustment will not be so easy, and must be more expensive. Let such cases be disposed of by either a member of Committee or the Tehseeldar.

22.—Let me impress on the Committee that there is no license of appropriation of private property even for the public good. There must be an adjustment, and a formal rendition made and acquittance given. The question was recently tried elsewhere in the Civil Court, and the

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Collector was compelled to compromise, to avoid heavy damages.

23.—One additional remark on the subject of roads I must press on attention. Repairs of cutcha roads should begin in October, especially of first and second class roads. If the Committee meet in September, the requisite arrangements can easily be made. The objection will be made that the *huttea*, or late October rain, which sometimes falls heavily, will wash away the superstratum of earth, or make the whole road a mass of mud; but this objection will not be applicable to one-tenth of the distance, and the gain of having nine-tenths thoroughly bound by grass and vegetation, which should never be separated from the top dressing, will far more than compensate for the petty additional outlay of repairs.

24.—I conclude this minute with a brief notice of bridges. Every large masonry bridge, that is any, the cost of which is 500 Rs. and upwards, is now registered, and every addition is to be inserted in that register. But there should also be a record of smaller bridges, and each should be annually inspected, and repaired when necessary.

25.—One of the first proceedings at the general annual meeting of Committee, after considering the report of past year's operations, and present and prospective funds, should be to take the Secretary's separate report of bridges, of additions made to the former series, and the state of each and every one. Their next proceeding should be to determine where temporary bridges shall be constructed in the ensuing year, the account of such undertakings being kept separate. Next will follow the revision of establishment, in case additions may be necessary, or reductions proper. Lastly, the measures to be

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adopted for each registered road will be considered and settled, the repairs to be made, and the bridges, if any, to be constructed.

(Signed) E. A. READE,
Commissioner.

COMMISSIONER'S OFFICE, 5TH DIVISION :
Camp Mhow, the 6th December, 1851.

PROPOSED REGISTER OF ROADS, ZILLAH AZIMGURH.

No.	Name of the Road.	Direction.	Distance in Miles.
		FIRST CLASS ROADS.	
1	The Jounpoor Road,...	Azimgurh to Jewalee, Jounpore boundary, ...	28
2	" Goruckpoor " ...	Ditto to Deoree Ghât, ...	26
3	" Ghazeepoor " ..	Ditto *viâ* Cheriakote and Sirseyna, to Ghazeepoor boundary. ...	20
4	" Benares " ...	Mahomedpore bridge *viâ* Deogaon, to the Jounpore boundary, ...	20
5	" Deoree Ghât " ...	Deoree Ghât *viâ* Ghoseo, Kopah, Mhow, and Rungbeerpore, to Ghazeepoor boundary, ...	30
			124
		SECOND CLASS ROADS.	
6	The Mahomedabad Road,...	Azimgurh *viâ* Sidharee bridge, and Mahomedabad to Mhow, ...	26
7	" Azmutgurh " ...	Azimgurh *viâ* Mobaruckpore, Azmutgurh, Ghosee and Bhimpoora to Nuggra, ...	50
8	" Kureemgunge " ...	Kureemgunge Ghât *viâ* Nuggra to the Ghazepore boundary towards Kasimabad, ...	17
9	" Secunderpoor " ...	Dherowlee Ghât *viâ* Secunderpoor and Buksee to Ghazeepore boundary, ...	12
10	" Mahole " ...	Azimgurh *viâ* Nizamabad and Mahole, to Pawai and Oude boundary, ...	34
11	" Koelsa " ...	Ditto *viâ* Captaingunge, Kourea Koelsa, Atrowleea to Pitkon Nuddee,	30
12	" Bebreagunge " ...	Ditto *viâ* Bebriagunge to Nynejore,...	21
13	" Deedargunge " ...	Ranee ka Serai *viâ* Serai Meer and Deedargunge to Jounpore boundary,	24
14	" Atrowlea Mahole Road, ...	Atrowlea *viâ* Aheroula Ghât, Mahole and Deedargunge to Jounpore boundary, ...	30

No.	Name of the Road.	Direction.	Distance in Miles.
15	The Maharajgunge Road	Raibhanpore Ghât *viâ* Maharajgunge, Captaingunge and Nizamabad to Mahomedpore bridge, ...	26
16	" Jewlee " ...	Jewlee *viâ* Deogaon to Ghazeepoor boundary, towards Khanpoor, ...	25
17	" Mhow Seydpoor " ...	Mhow *viâ* Cheriakote to Ghazeepoor bondary, towards Seydpoor, ...	23
			318
		THIRD CLASS ROADS.	
18	Branch Road, ...	Nugra to Secunderpoor, ...	12
19	" " ...	Deoree Ghat to Secunderpore, ...	38
20	" " ...	Pheersatanee or No. 8 *viâ* Madhobund Thannah to Chokout No. 19, ...	19
21	" " ...	Hybutpore No. 20, *viâ* Bhimppoora, Thannah to Karcha, Ghazeepoor boundary, ...	18
22	" " ...	Madhobund Thannah to Ghosee Tehseeldaree, ...	10
23	" " ...	Azmutgurh to Imlan junction with No. 5, ...	11
24	" " ...	Mahomedabad *viâ* Wulleedpore towards Azmutgurh junction with No. 7.	7
25	" " ...	Ditto to Mobaruckpoor junction with No. 7, ...	7
26	" " ...	Maharajgunge *viâ* Bebreagunge to Chuck Chuttur junction No. 2, ...	15
27	" " ...	Ditto to Aherowla Ghât on the Tonse junction No. 14, ...	16
28	" " ...	Bebreagunge to Loochoot junction with No. 2, ...	9
29	" " ...	Ranee ka Serai to Nizamabad, ...	5
30	" " ...	Serai Meer to Bahur junction with No. 10. ...	6
31	" " ...	Chowkeea Jounpore boundary *viâ* Pawai to Rajahpoor, Oude boundary, ...	11
32	" " ...	Lallmow junction with No. 16 *viâ* Belha Banse junction with No. 17.	12
			196
		Total, ...	638

(Signed) E. A. READE,
Commissioner.

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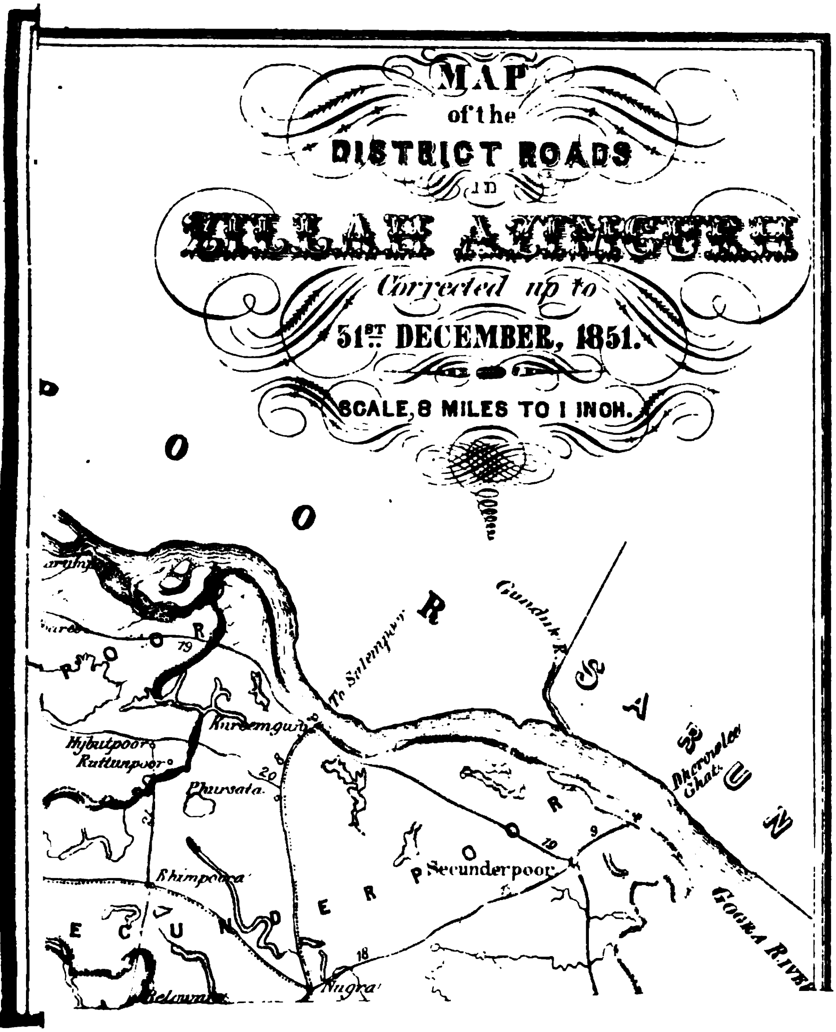

Turos, called Dewa, which, owing to the mismanagement,

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SETTLEMENT AND SURVEYS.

No. I.

AMENDMENT OF SETTLEMENT RECORDS.

From F. B. Pearson, Esq., *Deputy Collector of Calpee, to* R. Lowther, Esq. *Commissioner of the Allahabad Division* (No. 45).—*Dated Calpee, 25th May, 1848.*

Sir,—Having, under the authority granted to me by the Government Orders No. 2250, dated the 28th of May, 1846, revised the settlement records of the eight mehals comprised in Mouzah Gooindee, Pergunnah Jelalpoor, and drawn out anew amended record thereof, I have the honour to submit herewith statements exhibiting the results of my proceedings, for the approval of the Sudder Board of Revenue :—

I.—A new village and 8 mehalwar statements, No. II.

II.—A new general statement, No. IV.

III.—A statement showing in juxtaposition the area and jumma of the mehals according to original and amended records.

IV.—A statement showing the transfers of land from the records of one mehal to those of others, and from one name to another, within the several mehals, in order to make the records agree with facts.

2. To these statements, which speak for themselves, I shall add but a few remarks. Prior to the separation of the village into eight mehals by the Settlement Officer, there were two turufs, containing each 4 bherees. It appears that there *had* been once a fifth bheree in Turuf Turos, called Dewa, which, owing to the mismanagement,

misfortune, or desertion of the proprietors, lost its distinct existence; all its best lands having been gradually transferred by private transactions to members of the other bherees, with which they were consequently incorporated. The remaining inferior lands, which had no individual owners, were regarded as the joint property of the turuf, and were distributed among the four mehals in the settlement records, but the division did not actually take effect. Though the greater part is barren, yet a considerable portion is culturable, and is included in the malgoozaree area, although excluded from the berar. As all the co-parceners of each mehal paid proportionably the revenue with which its share of it was assessed, the cultivation of it should have been managed in common, and the rent fairly shared. But, in point of fact, the proceeds of this land have been entirely appropriated by the individual zemindars who have been able to cultivate any patch of it; while the others, ignorant of the circumstance, or too weak to resist injustice, have been defrauded of their share in them. In order to redress this wrong, which in course of time would not improbably have led to quarrels, an equitable mehalwar and assameewar division of the land common to the four Turos mehals has been made afresh by the proprietary body, who have not, however, deemed it necessary to alter the existing distribution of the Government demand on the four mehals.

3. For the slight alteration which has been made in the allotment of jumma on the Upros mehals, as fixed at the recent revision of settlement, I will briefly state the reason. In former times, when the custom of private transfer of a defaulter's lands to another putteedar, or set of putteedars, was not limited in its sphere, as it now is, by the separation of the four bherees into distinct mehals, a defaulter belonging to Subsookh's bheree made over, or abandoned, or forfeited, his field to the Upros community, who rated them-

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selves to realize the arrear due from him. Since then to the present time, the field has been held in common by the four bherees, who have taken equal shares of the rent, and paid equal shares of the revenue with which it has been charged. It was not, however, divided among the four bherees when they were constituted separate mehals, but entered as the sole property of Thoke Subsookh, to which it originally appertained, while the ancient bhereewar allotment of the jumma was retained on the mehals. The correction of this error was the more necessary, as, besides the anomaly of land remaining common to the turuf after the formation of the four mehals, the basis of the berar is now no longer the same in all of them. The zemindars decided that the land should henceforth be relinquished altogether to Thoke Subsookh, which should pay the whole of the revenue leviable from it. Accordingly, the jumma of Thoke Subsookh has been increased by the addition of twenty-nine rupees, and that of the other three mehals has been severally diminished in due proportion; the new allotment coming into operation at once, conditionally on the sanction of the Government, which is solicited.

I have, &c.,

F. B. PEARSON,
Deputy Collector.

CALPEE DEPUTY COLLECTORSHIP:
The 25th May, 1848.

[NOTE.—This letter is inserted with reference to the observations on the formation into separate mehals of the puttees of bhyacharah estates, as discussed in pp. 61 to 71 of the printed report of Mr. Muir's Settlement of the Calpee Pergunnahs of the Humeerpore District. It is instructive, as showing the small causes which tend to disorganize village communities, and to which the proper remedy must be applied, in order that those villages may prosper.]

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No. 2.

EXPENSES OF THE SURVEY AND SETTLEMENT OF THE NORTH-WESTERN PROVINCES.

Letter No. 362 of 1850, dated 9th August, from W. Muir, Esq., *Secretary to the Sudder Board of Revenue, North-Western Provinces, addressed to* John Thornton, Esq., *Secretary to Government, North-Western Provinces, respecting the expenses of Survey and Settlement.*

Present:
H. S. Boulderson, Esq.,
Senior Member.

Sir,—With reference to the orders contained in your letter No. 2733, dated the 5th July, 1847, I am now directed by the Sudder Board of Revenue, North-Western Provinces, to submit, for the consideration of His Honor the Lieutenant-Governor, a statement exhibiting the expenses incurred by the late survey and settlement of the North-Western Provinces.

2,—The Board have experienced much assistance from Mr. P. B. Reid, Deputy Collector of Agra, in the preparation of this return. It has been drawn up almost entirely from the records in the office of the Revenue Accountant. A copy of an explanatory note by Mr. Reid is enclosed, from which His Honor will perceive the very detailed and laborious process by which every settlement and survey charge has been sought out, and the whole thrown together and tested. The expenditure during the year 1833-34 alone has been obtained by a reference to the District Officers and their accounts; the records of the Revenue Accountant commencing from after that period. The delay in forwarding this statement has arisen from the tedious process above referred to, and the necessity of repeatedly remanding it for alteration and amendment.

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3rd.—The aggregate of the entire expenditure is Rs. 57,27,249, which applied to the jumma of the years 1846-47 [Rs. 4,05,29,921] falls at the rate of Rs. 14·13 per cent. The assessment of such districts* as did not come under the operations of Regulation IX. of 1833, has been excluded from this and the following calculations. The rate per cent. upon the area, calculated in acres, [Rs. 4,60,70,658], falls at Rs. 12·43.

4th.—Survey Charges. The Board proceed to notice the portion of the above sum which falls to expenses connected with the survey. It amounts to Rs. 23,56,555, and falls at the rate of Rs. 5·81 per cent. on the jumma, and Rs. 5·11 on the area.

5th.—Three items have been separately classed in the statements A., B., and C. The first embraces charges on account of the Office of Superintendent of Surveys at Allahabad, and contains the following details :—

Captain Bedford's establishment and charges,			Rs. 1,62,048
Mr. H. M. Elliot's	ditto	ditto, ...	„ 55,292
Captain Wroughton's	ditto	ditto, ...	„ 25,066
			Rs. 2,42,406

The details of heading B. consist of charges incurred by the Surveyor-General at the Presidency, and charged against the survey of these Provinces, amounting to Rs. 20,565. The sum of Rs. 2,05,952, denoted by C., represents the "batta," gratuity, &c., paid to the officers of the Military Department while engaged on the survey, and similarly debited to the North-Western Provinces.

6th.—The remaining sum forms the direct expenditure of survey, and has been distributed over the several districts. But the result cannot be trusted *in detail,* because

* Province of Kumaon, Districts of Bhutteeana and Debra Doon.

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* Division.	Survey Charges.	Percentage on	
		Jumma.	Area.
Delhi, ...	79,941	2·44	1.48
Meerut, ...	1,39,196	2·01	2·14
Rohilcund, ...	3,83,940	6·01	4·73
Agra, ...	2,59,040	3·53	4·46
Allahabad, ...	3,54,747	4·13	4·68
Benares, ...	6,70,767	8·35	5·28
Total, ...	18,87,631	4·66	4·09

the Surveyor and his establishment were often borne nominally upon one district, while they were employed in the survey of another. The expenditure classified by divisions is noted in the margin,* though even here the same cause produces a dubious result. The rate upon the whole falls at Rs. 4·66 per cent. on the jumma, and Rs. 4·09 on the area.

7*th*.—The entire expenses of the survey constitute 41·15 per cent. of the combined expenditure of the settlement and survey.

8*th*.—*Settlement Charges.* The charges proper to the settlement from the remaining 58·85 per cent., and amount to Rs. 33,70,694.

9*th*.—This falls at the rate of Rs. 8·31 per cent. upon the jumma, and Rs. 7·09 upon the area.

The charge may be classified as follows :—

			Amount.	*Proportion.*
I.	Salary of Covenanted Officers,	Rs.	11,09,052	32·90
II.	Ditto of Deputy Collectors under Regulation IX. of 1833, ...	„	4,26,586	12·65
III.	Office and Establishment, ...	„	15,43,781	45·80
IV.	Contingencies, ...	„	2,91,275	8·65
		Rs.	33,70,694	100·00

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10*th*.—It is to be remarked that only those officers appointed expressly for settlement duty, over and above the usual establishment of a district, have been entered in this account. Where a Collector, for instance, performed the duties of a Settlement Officer, no charge would appear on his account under the first head. This will explain much of the inequality which is apparent in the proportion at which the settlement charges fall upon individual districts. Thus to take the two first districts.* In Paneeput the allowances of Messrs. Edmonstone, Barnes, and Mill, continuing for four years, contribute to swell the rate of settlement charge: while that of Hissar is much below the average, the settlement duties having been performed by the Collector.

* District.	Percentage of Settlement charge on	
	Jumma.	Area.
Paneeput, ...	12·52	12·41
Hissar, ...	4·87	1·04

11*th*.—The districts in which the expenses have fallen heaviest are specified below. In all of them, except Delhi, the charge for covenanted supervision forms an important item:—

	Rate per cent. on	
	Jumma.	*Area.*
1. Humeerpoor, ...	16·45	13·27
2. Etawah, ...	15·55	19·01
3. Moradabad, ...	14·93	10·13
4. Calpee, ...	13·18	11·08
5. Paneeput, ...	12·52	12·41
6. Ghazeepoor, ...	12·08	12·92
7. Delhie, ...	11·24	10·19
8. Benares, ...	10·66	14·48
9. Mynpoory, ...	10·43	11·02
10. Budaon, ...	10·36	7·49
11. Goruckpoor, ...	11·75	5·29

12*th*.—The districts in which the expenses fall lowest are the following:—

	Rate on	
	Jumma.	*Area.*
1. Muttra, ...	2·07	2·29
2. Meerut, ...	3·50	3·08
3. Rohtuck, ...	4·50	3·29
4. Hissar, ...	4·87	1·04
5. Furruckabad, ...	5·05	5·84
6. Boolundshuhur, ...	5·06	4·44

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In all these districts there is either no charge, or a very low one, on account of Covenanted Officers.

13*th.*—The following is an abstract of the percentage of settlement charges upon each division:—

Division.	Charge per cent. on the Jumma.	Charge per cent. on the Area.
Delhie, ...	7·71	4·67
Meerut, ...	6·37	6·80
Rohilcund, ...	8·87	6·99
Agra, ...	7·80	9·85
Allahabad, ...	8·26	9·34
Benares, ...	10·33	6·53
Upon the whole, ...	8·31	7·53

14*th.*—It should be borne in recollection that the calculations are framed upon the assessment of 1846-47, and that wherever the jumma is progressive, the percentage would fall lighter if deduced from the full ultimate assessment. In juxta-position with the demand of 1846-47 has been placed that of 1824-25. There was a difficulty experienced in ascertaining the jumma of 1229 Fuslee (1821-22), the year suggested in your letter.

15*th.*—On referring to the various reports of the Settlement Officers, as directed in the 3rd paragraph of your letter, the Board do not find any notices of such a description as to illustrate the subject now reported.

I have, &c.,

W. MUIR,

Secretary.

SUDDER BOARD OF REVENUE, N.-W. P.;
The 9th August, 1850.

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No. 8.

FINANCIAL RESULT OF REVISION OF SETTLEMENT UNDER REGULATION IX. OF 1833, IN THE NORTH-WESTERN PROVINCES.

LETTER No. 472 *of 1850, dated 4th October, 1850, from the Secretary to the Sudder Board of Revenue, addressed to the Secretary to Government, North-Western Provinces.*

SIR,

I am directed by the Sudder Board of Revenue to submit, for the information of His Honor the Lieutenant-Governor, a Comparative Statement, which has been prepared in their office, showing the financial result of the late revision of settlement under Regulation IX. of 1833.

2. The demand and collection of land revenue, and the gross income on account of Abkaree and Stamps, have been compared of the Fuslee years 1232-36, and the official years, 1842-43—1846-47.

3. The return has been compiled from statements submitted by each Collector; and the principle observed has been to enter the items of the several districts for each year, precisely as the districts were constituted at the time. A great degree of accuracy has by this process been obtained for the *general* result. But the details are thus rendered less certain for the comparison of the assessment and collections of the several districts, separately, at different periods; because they were subject to decrease or increase by the transfer of villages or pergunnahs. Such changes, it is obvious, do not affect the total returns for each year.

4. It will be observed that the average collections of the five years after the revision of settlement, exceed those prior to settlement by Rs. 17,31,211; but this includes the assessment of resumed maâfee lands, which could not be separated from the khalsa returns.

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5. The Board remark that the increase to the assessment in Zillah Goruckpoor forms the principal item of this enhancement of the land revenue.

6. There is also an increase in the Abkaree collections of Rs. 1,30,649, and in the Stamp Department of Rs. 5,00,956.

7. It must be borne in mind that all these returns refer only to the portions of the North-Western Provinces which have been settled under the provisions of Regulation IX., 1833; and that Dehra Dhoon, Kumaon and Bhutteeana, as well as Saugor and the permanently assessed portions of the Benares Division, have been excluded from the computation.

I have, &c.,

W. MUIR,

Secretary.

SUDDER BOARD OF REVENUE, N.-W. P.:
Agra, the 4th October, 1850.

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No. 4.

FORESTS AND SWAMPS IN PILLIBHEET.

Survey Report on Forests and Swamps in Pillibheet, in the Pr vince of Rohilcund, by LIEUTENANT BURGESS, *&c.*

14—SURVEY OF THE PILLIBHEET FOREST AND MALA SWAMP.—The Pilleebheet forest has been carefully and minutely surveyed, including the Mala swamp, situated between it and the Poorunpoor forest grants. This forest is also to be divided into grants, but the whole tract is so intersected by natural and other well-defined boundaries, that the Collector will be able to do this without the assistance of the Surveyor, as applicants came forward for the land,, and as may appear at the time most desirable and convenient.

15.—The portion of forest that, on the draining of the Mala, will be the most valuable of the whole, is at present almost utterly worthless, and it would be hopeless to expect any improvement in the adjoining lands of Pilleebheet or Poorunpoor, situated within the influence of the swamp, till this is accomplished.

16.—It is therefore evident that all hope for the improvement of this part of the district must rest upon the success of the attempt to drain this swamp, and in order to give a better idea of the effect of its position on the surrounding country, I have continued the Pilleebheet Map to its head in the Bilheree forest; and though I am not yet in possession of sufficient data to enable me to enter into any plan for getting rid of it, a few remarks upon it will not be out of place here.

17.—TOPOGRAPHICAL DESCRIPTION OF THE MALA.—The Mala takes its rise in the forest covering the high ridge of

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land that, commencing at the foot of the hills west of Birmdeo, continues far south throughout the Shahjehanpoor District, and forms the grand water-shed line between the Sardah and Deoah rivers. It commences immediately south of the old settlement of Sooraee, and looks like the old bed of a considerable stream, or rather of two rivers joining a short distance below; but there is nothing in the appearance of the country above to lead it to be supposed that any river ever existed here or that the bed extended higher than at present.

18—The Sardah has once cut to within one and a half mile of the head of the Mala, and since gradually worked its way back eastward; its old course under the forest being shown by a bank rising to fifty feet or more in height and an extensive line of swamps; the Hooden or "Kala Keemch" being by far the largest, having a breadth of fully three-fourths of a mile, and continuing to, what is now called, the Chooka river; but there is no appearance of even any portion of its floods having swept over the forest into the Mala, and scooped out this hollow. Had such ever occurred, the whole river would probably have followed, and wrought great changes in the country below.

19.—The Khukra runs on the west side of the forest, about five miles off, but does not appear to have ever come nearer than at present. We must therefore look for other causes to account for its formation.

20.—On looking over the country between the forest and the Deoha river, it is evident that great changes have taken place, and are still going on; the whole surface of the country being intersected and cut up by what cannot be mistaken for other than the partially silted up beds of rivers, only the deep elbows or bends now remaining; such

also form a very peculiar feature in the forest below Mahope, and through one of these I am much inclined to think that one of the rivers now running into the Deoha, or even the Deoha itself, once flowed, joining the Mala below Jalee Koond. The portion above may be accounted for, as suggested by Mr. Dick, by supposing the river to have cut back, as we often see in the formation of a ravine, till it has reached its present extent. This, far from being a matter of useless speculation, would be of great importance to know, as in the event of other means failing to drain the swamp, it may be possible to turn one of these rivers, perhaps the Khukra, again into it, and by means of a running stream do away with the effect of the stagnant water. I would, therefore, recommend levels to be continued from Chorghatta, across the country to the Khukra near Newrea.*

21.—Certainly, when the Sardah flowed along the edge of the forest, more water than at present may have percolated through the shingly and gravelly sub-stratum; but the springs breaking out at this time are very insignificant, causing, together with all the drainage of the forest and intervening country for miles, and, after its junction with the Kutna at Gujrowlah, only a very small water-course. The upper part of the bed to within about three miles above Chorghatta is perfectly dry; but from this point the swamp continues without a break to Gujrowlah, a distance of nearly thirteen miles, with an average breadth of 1, 600 feet, and covering an area of 2,481 acres,—in the whole of this distance there being no place where a laden animal can cross, except by the artificial causeway and bridge at Chorghatta.

22.—A series of levels have been taken from Dulgunjun Singh's bund at Puttea to Chorghatta, with cross sec-

* On finding the lower levels so much more favorable than I expected, and having no leisure at the time, I gave up the idea of continuing them further than Chorghatta, as not being required.

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tions of the country to the west, and connected with the great Trigonometrical station at Umra, but owing to some misconception of instructions they were not connected with the *surface of the water*, and this was not discovered till too late to remedy the error during the past season.

23.—PROPOSED TO DESTROY THE BUND AT PULLEEA, AND STRAIGHTEN THE COURSE OF THE RIVER, BUT DOUBT OF ENTIRE SUCCESS OF THE PLAN.—The bund above mentioned, together with the very tortuous course of the stream below, must doubtless have a great effect in causing and keeping up the swamp; but even were the bund to be destroyed, and a canal dug as straight as possible (and this should be done at once, whatever may be determined upon hereafter) from the corner of the forest above Gujrowlah to the bund, thereby reducing the distance of the stream 3 miles in 5½, I doubt if it would succeed in entirely, or even nearly, draining the swamp.

24.—VALUE OF A KNOWLEDGE OF THE STRATA UPON WHICH IT RESTS.—It would be of great value to obtain a few borings in various parts of the swamp, to ascertain the nature and thickness of the under-lying strata. If the water is kept up by an impenetrable stratum of clay, as is most probably the case, some effect might be produced by boring wells here and there through it, by which to allow the water to subside.

25.—The work will be greatly expedited by increasing the volume of water, by turning some stream from above into it, if only temporarily, and till the long grass, with which the bed is choked, is destroyed.

26.—PROPOSED METHOD OF DIVIDING THE SWAMP.—The swamp, when drained, will have to be divided between the Poorunpore and Pillibheet grants and villages; and I propose, instead of making the boundary an imaginary

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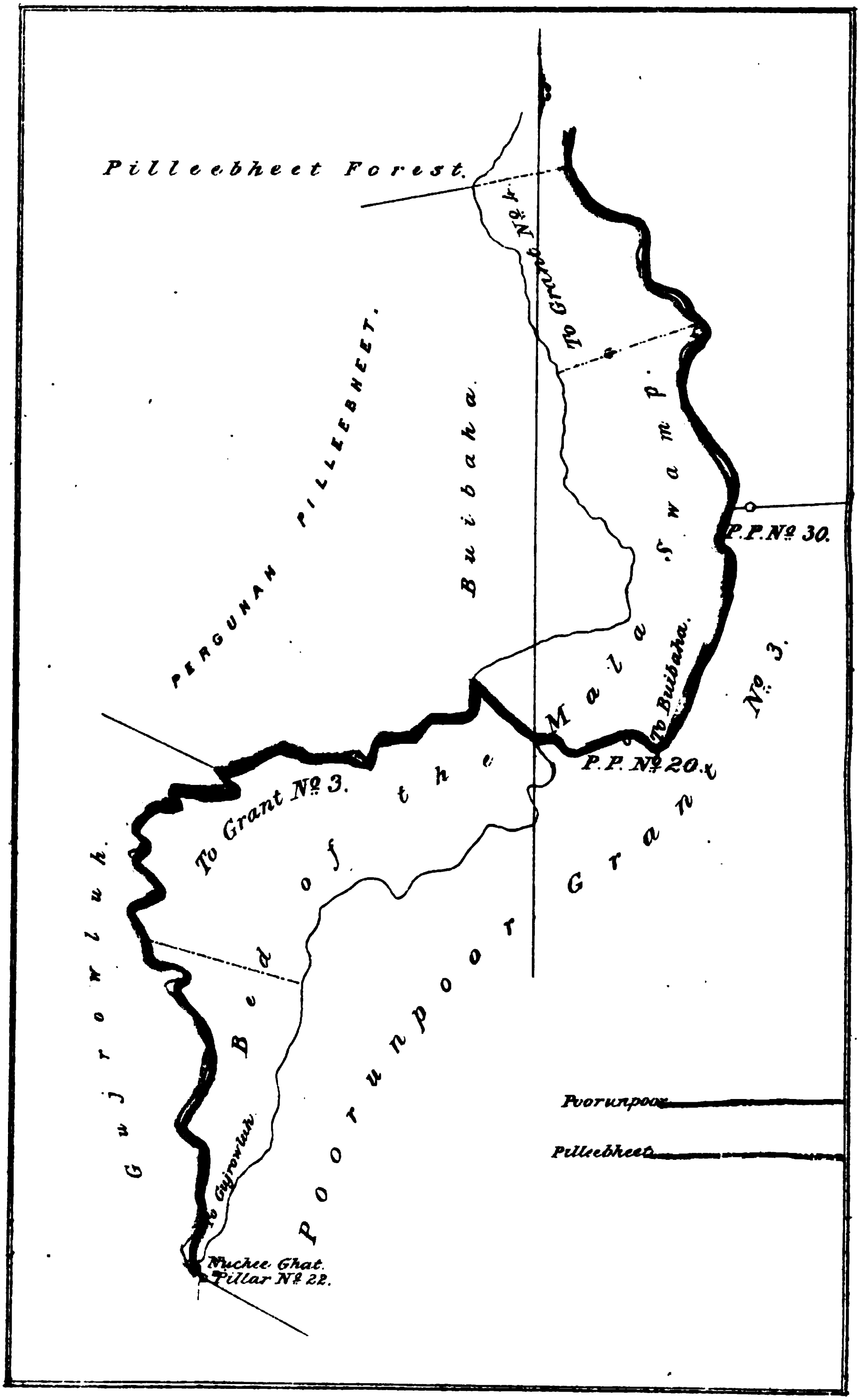

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line down the centre, to divide the portion opposite to each grant, or village, by a line completely across, to be shown by pillars on either side, making the area above and below equal.

27.—The case exemplified in the accompanying sketch will, it is hoped, explain what I mean. I have given the centre portion of the Mala swamp opposite Buibaha to this village, and a portion above and below, together equal to this, to each of the grants Nos. 3 and 4 opposite; and in the portion opposite Gujrowlah I have given the upper part to No. 4 grant, and the lower to Gujrowlah.

28.—This will, I think, lead to less confusion than any other way of dividing it, for even supposing a well-defined stream to succeed to the present swamp, this would be always subject to change, and might make a very unfair division of the most valuable part of the grants.

29.—I had the villages outside the forest surveyed during the time I had no other work for my establishment, and this has enabled me to settle the boundary between these villages and the forest, so that the area of each should, as nearly as possible, approximate to that given by the former survey by Captain Brown.

30.—Bilheree Forest not yet complete.—The Bilheree forest is complete, with the exception of a small portion near Mahope. The native surveyor, Hoossein Buksh, sent to survey this was taken ill and obliged to leave; heavy and continuous rain throughout the latter part of March prevented another man being sent there before the unhealthy season set in; and my previous experience of this part of the forest made me careful of running the risk of a repetition of such sickness as we were visited with the year before at this place. I was the less anxious too about it, that I expected to be employed another season in marking out this part into grants, when I should have been able to complete it.

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31.—I am very well pleased with the way the part of the work has been done; the country is extremely difficult, almost beyond conception.

32. PROSPECTS OF ITS IMPROVEMENT.—The forest, as far as Sooraee, may probably soon be reclaimed; the centre is open, and the ruins of an old fort, musjids, wells, &c., and the large mango topes scattered about, mark the former site of an extensive settlement, and though this was in times when the security of the forest offered sufficient inducement to brave its unhealthiness, yet it appears to have risen to greater importance, and to have been of altogether a more permanent character than any other place I have met with similarly situated.

33.—The forest gradually becomes thicker to the east, and towards the edge is an impervious thicket. Improvement here must follow slowly, and below is the Hoodeon swamp before mentioned, as bad or worse than the Mala, tainting the country with its exhalations. This, like other deserted river beds, will probably silt or grow itself up in the course of time; but a very long period must elapse before such occurs in the course of nature, and it may be advisable to see how far this also can be assisted by artificial means.

34.—As we get further north, the country becomes even less favorable to the progress of improvement; the forest thick, close and stunted, and overgrown with underwood, and the timber of little or no value, while the distance from the means of irrigation makes it perhaps the least desirable of the whole forest, unless such a work as a Sardah Canal were to be carried through it, and thus change the face of the country.

35.—The villages left unfinished the previous season have all been surveyed.

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Supplemental Report, by LIEUT. BURGESS, *upon the* MALA SWAMP.

137.—A series of levels, carefully taken during the past season, gives the following data, and has enabled me to give an opinion upon the subject of the drainage.

138.—Fall of surface of swamp from the bridge at Chorghatta to the bridge at Gujrowlah (Muchnee Ghât), distant 9½ miles=9·23 feet or 0·69 feet per mile, and thence to the bund at Pulleea, distant 4¾ miles=5·62 feet, or 1·18 per mile, and the total fall in 14¼ miles=14·83 feet.

139.—The latter, 4¾ miles along the tortuous course of the Mala, may be reduced by a canal to 2 miles, which will give a fall of 1·29 feet per mile, supposing the Pulleea bund to be retained in the present state; but its destruction would add another 7 feet to the fall, or increase it to 1·90 per mile, which should be sufficient to drain the swamp rapidly.

140.—I therefore recommend the drain to be dug from the bridge at Gujrowlah to the bund at Pulleea, with a section something like this.

The small ditch will be sufficient to carry off the ordinary drainage, and the upper part for the floods.

141.—The slopes must vary according to the soil; if a stiff clay, as will probably be found, very little will be requisite.

142.—As soon as the lower part of the swamp is sufficiently dry to admit of its being done, the drain should be continued up the bed, as was done by Mr. Drummond in the Sisownah swamp;—smaller drains running into the main drains will be required to meet pools away from it. No one, however, unacquainted with the nature of these swamps, can form an idea of the difficulty of making such

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cuts; and a draining plough, worked by elephants, or a "crab" or windlass on the bank, might, I think occasionally, advantageously be employed in the work. The difficulties are not, however, greater than Mr. Drummond's energy has overcome at Sisownah, though the extent is so very much greater.

143.—In the event of the Pulleea bund being destroyed, as it should be, if only temporarily, it remains to be seen how far Dulgunjun Singh can be re-imbursed for the loss to his irrigation works. There can be no objection to his being allowed the use of the drainage water, but he should not be allowed to raise the water to such a height as to affect the upper drainage. If the water *is* retained for irrigation, it should be by masonry works that will readily allow of it being run off, and sluicing the canal.

144.—It therefore appears that no insurmountable difficulties present themselves to the accomplishment of this most desirable object: and, independent of the enormous return that will immediately result from the swamp as it dries up (for the gigantic reeds with which it is choked have formed probably for ages, as they do now, the roosting place of myriads of birds, which have converted it into a perfect guano bed), it is hoped that an equally important improvement will follow in the health of the neighbouring district.

145.—The Kutna river, running west of the forest and joining the Mala at Gujrowlah, also requires a little attention; the numerous little bunds are already causing swamps and are calculated to increase the evil.

146.—The fall of the gool in 1¾ mile was only 1·25 feet, but the levels were taken after the very heavy fall of rain in January, when the country was completely flooded, and the water in the gool held up.

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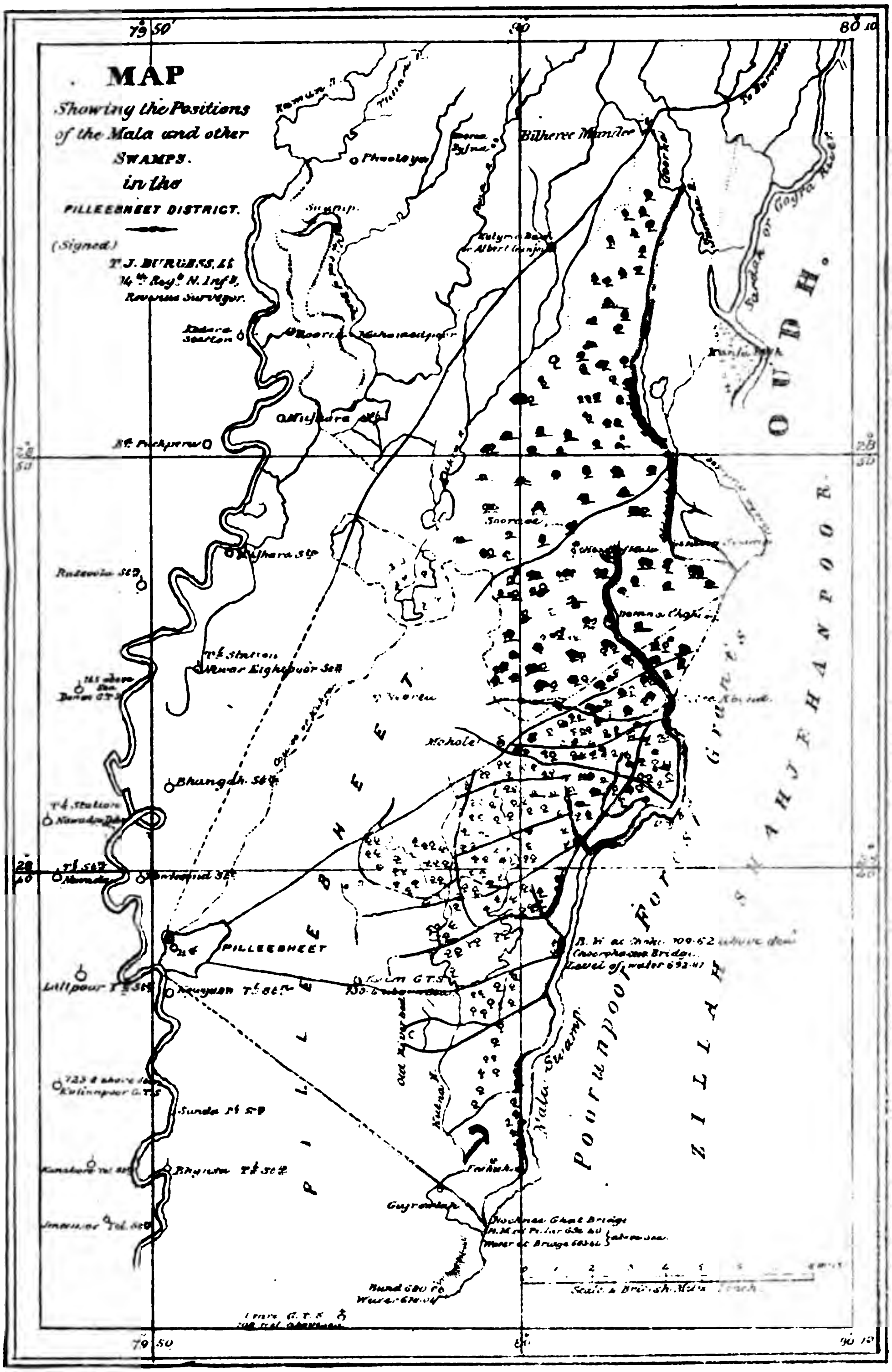

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No. 5.

REPORT ON THE MOQUDDUMEE BISWAHDAREE SETTLEMENT OF PERGUNNAH BARRAH, ZILLAH ALLAHABAD.

I.—*From* R. TEMPLE, ESQ., *Officiating Deputy Collector of Allahabad, to* R. LOWTHER, ESQ., *Commissioner, Allahabad Division.—Dated Allahabad, 9th December, 1850.*

IN reply to your letter, dated 26th July last, No. 489, I have the honor to submit the following report on the moquddumee biswahdaree settlement of Pergunnah Barrah. At the same time I deem it proper to prefix to my report a brief retrospect of the past fortunes of this pergunnah, such as authentic record or credible tradition may enable me to offer.

2.—Pergunnah Barrah originally formed a portion of the kingdom of Rewa, the territories of which principality belonged to the Mussulman empire of Hindoostan, but appear to have been exempted under the Moghul Emperors from the payment of tribute or land tax.* During the reign of Akbar it was included in the Sirkar of Bhutgorah; † and again in the Sirkar Tuchar, after the province of Allahabad had been finally added to the dominions of the Nawab Wuzeer of Oudh. It is evident that, in order to become incorporated in either of the above Sirkars, this pergunnah must have been disunited from Rewah. There is no precise information regarding the manner in which this separation was brought about. Up to the Nawab Asuf-ood-dowlah's time, however, the Sovereigns of Oudh do not appear to have made their authority much respected in Barrah. The Talookadars of this pergunnah being on the frontiers of the two kingdoms, Oudh and Rewah, probably managed to escape the control of either.

* *Vide* Note A. † Note B.

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However, their holding the pergunnah of Arail in farm as a fief from the Nawab Wuzeer would imply, that, to some extent, they acknowledged the supremacy of Oudh. But in the year 1778, during a petty war carried on between the Nawab Wuzeer and the Rajah of Rewa, the Talookadar of Barrah* sided with the latter, and when the Nawab Wuzeer's force, commanded by an European gentleman named Osborne, proved entirely victorious over the Rajah and his dependents, this pergunnah, together with the adjoining estates of Chowkundee, was fully subjugated, and farmed out for a season to Mr. Osborne himself.† From this date the pergunnah underwent no further changes of Government till 1801, when it was ceded by the Nawab Saadut Ali to the British. Its internal management was confided to the Talookadars, from whose assessed taxes five per cent. was deducted for local administration, or rather for the support of 300 mounted and 500 foot officers, composing that non-descript kind of force usually maintained under Native Governments for mixed purposes of Revenue and Police.

3.—During all these political vicissitudes the proprietorship of the land rested with a family that bore the title of Talookadar. The question naturally suggests itself as to who these Talookadars were, and how they attained their feudal position. Now the aborigines of the soil were Bhurs. This now despised race were formerly possessed of much industrial wealth, and several ruined forts still remain as monuments of their skill and power.‡ But here, as in many other localities, this tribe was driven away by the invasions of Rajpoot bands belonging to the Bais, Bughail, Bunapur, and Puryhar classes, who then assumed proprietary possession of the land. These eventually paid allegiance and land tax to a Bughail family residing at Bandogurh, from whom sprung the

* Lal Bikramajeet. † *Vide* Note B. ‡ *Vide* Note C.

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present line of Rewa Rajahs. Besides these an ancient family of Kayeths, who filled the clerical offices of the pergunnah, held one large estate, and several villages had been granted as a votive offering to some Chowdree brahmins by Raja Ram, one of the Rewa kings, who had been successful in a contest with some neighbouring chiefs on the other side the Ganges. These, as well as the Rajpoot races above enumerated, may be looked upon as the original zemindars of Barrah. To a member of this regal family, named Pirthee Chund, two villages named Emilia and Deora were granted by the Rajah of the day in rent-free tenure. From this small beginning Pirthee Chund acquired the whole pergunnah, assumed for himself and his descendants the prœnomen of Lal, and founded at Deora the family who in the subsequent periods of the history appear as Talookadar. First, eleven other villages in the neighbourhood of Emilia were allowed him, in order that he might sustain his state. Then he obtained eleven more villages subordinate to Deora, in acknowledgment of services he rendered in collecting the Rajah's revenues in other parts of the pergunnah. A footing having been thus established, he and his descendants addressed themselves to the task of reducing the resident proprietors throughout the pergunnah, and raising up for themselves a zemindaree position independent of the Rewa Rajah. First, they would stand security for some proprietors, and when default occurred would possess themselves of the estates. With the same view they would grant loans. Then they began to use force. Sharp resistance was, however, met with in several conflicts, which are still remembered by the villagers. The Bunapurs of Tikree fought the usurper to the last, and the "chourah" (funeral pyre) which they raised to the memory of their slain is still to be seen. At length, however, these Bunapurs yielded, when their leader Duljeet was seized and put to death in

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the invader's stronghold at Nowrhèya. The Bais of Chillah Gowhanee were at feud with the Chowdrees of Birwul. So fair an opportunity was not to be neglected by the Lal. He fomented the dispute, interposed between the disputants under pretence of aiding one of them (the Chillah Gowhanee people), and thus possessed himself of the estates of both, including a circle of subordinate villages. Bela Moondee, held by an ancient family of Kayeths, was also the scene of some bloodshed. To distress the villagers, the Lal blocked up their principal well with boulder stones.* His Dewan, Lalla Pandé, lost his brother in the fight. In compensation for this loss, the Lal granted him a village on rent-free tenure, which was held maâf by his descendants for many years, till it was resumed by the British Government at the general resumption. There are two chourahs at Bela Moondee,—one in commemoration of the slaughtered Kayeths; another called "Ghor Mura," in memory of a favorite horse killed during this combat. Petty conflicts in defence of proprietary right were maintained by the zemindars of Purtabpoor, Cheree, and Geenge. The latter village was held by Bughails of the same family as the Lal. Being countenanced by the Rewa Rajah, and being actively assisted by the zemindars of Chainoo, which has always belonged to the Rewa territory, they held out longer than any of their fellow zemindars against the encroaching Lals. This process of fusion was finally completed under Lal Bikramajeet, who has been mentioned in the last paragraph as contending against the forces of the Nawab Wuzeer in 1780. At that time he certainly was, in virtue of forcible possession, Zemindar and Talookadar; and so he and his successor remained until the period of the Company's rule. Having universally reduced the resident proprietors, the Lals succeeded in many instances in expelling them altogether, and in

* The well is still to be seen.

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introducing their own dependents. Such was the origin of those service grants and feudal tenures, which have been fully explained in Mr. Alexander's Report. All or nearly all the Chundel reports now scattered about the pergunnahs were imported from Bundelcund in this manner. I have particularized the contests between the Lal family and the villagers, in the hope of throwing light on the origin of proprietary tenures in this pergunnah. Up to the present settlement the Lal family have always been considered as *bonâ fide* zemindars. Now whatever they may have become subsequently, it is evident from the circumstances above noted that they had no original right to such a title. The real zemindars had all been violently, or otherwise improperly, dispossessed within the last 150 years. Even if the details of this dispossession were denied or doubted (for which, however, there is in reality no reason), there would still remain two indisputable facts which would suffice to support this view. The primary occupants of the villages (excepting of course the aborigines) were Rajpoots of various tribes. The party styling himself zemindar of these same villages is a member of the regal family of Rewa, that once ruled over this pergunnah. Now it is consonant, with all experience and history of the Rajpoot race, to conclude that in those lands which they originally won by their sword they establish such an occupancy as amounts to proprietary holding, and this occupancy they never part with, except when compelled to do so by sheer violence. It would therefore follow that when these Lals possessed themselves of estates held by Rajpoot communities, they *must* have done so through regular compulsion; that they might with propriety be Talookadars, or that all the prerogatives of the Rewa Rajah might be delegated to them, or that they might exercise in Barrah the same rights as in Arail (which never amounted to proprietorship), is quite intelligible. But the Rajah never claimed proprietary possession of the land, and therefore the Lals could not with

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justice obtain it. It would appear at first sight that a biswahdaree settlement would be the very best means of remedying the injustice originally perpetrated by the Lals, but unfortunately in many cases the dispossession had been so complete, and the course of time had brought with it so many changes and alienations of property, that at the time of settlement the descendants of the original zemindars were only found in thirteen villages, and in only nine of these were they in such a position as to be entitled to a moqaddumee tenure.

4.—Having thus endeavoured to describe the origin of this family, I shall proceed with their annals. Their misfortunes (from which they have not yet recovered) began in the life-time of Lal Jugutraj, the grandson of Bikramajeet. The revenue having of late been paid irregularly, and the Rajah of Manda, in Khyragurh, grandfather of the present Talookadar, having offered to pay an increase on the revenue of Rs. 12,000, the Nawab Wuzeer's Subadar at Allahabad closed with him, and placed him in possession, having expelled Jugutraj. The small force which the latter kept up for Police purposes made a stand for their master's rights at a village called Sind, but without effect. Jugutraj complained at Lucknow against this most arbitrary proceeding, and was reinstated two years afterwards by order of the Nawab Wuzeer in 1799, on condition of paying an enhanced jumma of Rs. 1,05,000 in lieu of the former jumma, Rs. 52,000. The farming lease of Arail was also restored to him. In 1801-02, the Barrah jumma was raised to Rs. 1,10,000. Towards the close of the year, the pergunnah was ceded to the British Government, who were to collect the arrears of the autumn, and the full proceeds of the spring harvest. Jugutraj failed to pay up either, and the whole zemindaree was sold to the Rajah of Benares in October of 1802. The Bughail wandered about in abject poverty for some time, till at length the Rajah of

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Rewa (generously forgetting the injury which the family had formerly by the rebellion inflicted on that kingdom) afforded him an asylum. The British Government also, in consideration of his fallen state, granted him a charitable allowance of Rs. 5,000 per annum. The Rajah, (however questionable the method of acquisition may have been) made good use of his acquisition. He devoted himself to raising the capabilities of the ground and the comfort of the husbandmen. He had the jungle cleared everywhere, and in some localities to such an extent that the rents of not a few villages were tripled and even quadrupled thereby. To the efforts which he made for the improvement of irrigation, I have on a former occasion drawn your attention.* Besides the costly works which he constructed at his own expense, an annual sum of Rs. 5,000 was appropriated for the appliances of irrigation, and a superintendent of bunds appointed on a monthly salary. The manner in which these exertions were seconded by his land agent, Sheonarain, is gratefully remembered by the people. Arrangements were made with the tenants every three years. When default occurred, it was thought better to keep the husbandman on the ground, and make him pay all by degrees, than to drive him away by coercion and exaction. By these measures the Rajah managed by the year 1820 to raise the pergunnah rent-roll from Rs. 1,10,000 to 2,32,000. Concurrent testimony declares the people to have been, during the Rajah's incumbency, far more prosperous and contented than they had ever been before, and quite as much so as they have been since. In the last-named year Chutterput Singh, son of Jugutraj, contested the sale in the Benares Court of Appeal. In the year 1821 the suit was transferred to the file of the Special Commission, by which tribunal the sale was reversed in the year 1826. The proceedings of the Commission show that the default was mainly brought about by the intrigues

* *Vide* my letter dated 19th April, 1850, No. 193.

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of several amlah, the creatures of one Deokenundun, who was anxious to procure the property for the Rajah, and that the sale was in every way a measure of needless severity. The following year (1827) an order arrived to hold the pergunnah under attachment until the issue of an appeal preferred in England by the Rajah should be known. About the same time there appeared reason to suppose that Chutterput was incompetent to direct his affairs, and accordingly the whole pergunnah was placed (as it still remains) under the jurisdiction of the Court of Wards, a malikanah allowance being made to the disqualified proprietor.

5.—In 1832 33 Mr. Speirs made a farming settlement throughout the pergunnah. The various classes from which the lessees were drawn for each village have been detailed by Mr. Alexander as well as by Mr. Speirs. Thirty-three villages were continued in the possession of the proprietor, and the jumma assessed upon them was deducted from the malikanah allowance. No professional survey was made at Mr. Speirs' settlement, and the survey since made for the whole district has not been extended to Barrah; but a careful field measurement was made, rent-rates and cultivators' holdings fixed, and all heritable rights possessed by the tenants were investigated. It is not necessary to recapitulate the grounds and proceedings which led to a moquddumee biswahdaree title being conferred on a large portion of Mr. Speirs' farmers by the settlement proceedings conducted by Mr. Alexander in 1848. These proceedings were brought to a close on Mr. Alexander's departure, in August of the above year. Up to that date it had been decided with respect to each estate, whether there were or were not any persons possessed of any heritable and transferable property in the land independent of the Talookadar. Rights of this nature were ascertained to exist in 92 out of 243 mehals. In the 92 mouzahs a moquddumee biswahdaree settlement was concluded. In the remainder (with the

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exception of twenty estates in the possession of the Talookadar, and seventeen resumed estates in the possession of the ex-maâfeedars) farming leases had been granted on the condition of adequate security being furnished. It then remained in the moquddumee villages to adjudicate the shares or holdings of the different co-partners, and to record the constitution of the village communities; and in the farming estates to perfect the arrangement by the due preparation of the security bonds. The completion of this work I have now the honour to report. Vernacular records had been drawn up, and most of the questions of co-partnership had been adjudicated by Meer Muqsood Ally before I assumed charge of the pergunnah. The greater portion of the security bonds had also been prepared. Those farmers who were at that time without sureties were most of them unpromising subjects; many of them failed to tender security at all, and were obliged to surrender their leases.

6.—I proceed to touch upon the main points of Mr. Alexander's settlement, both as regards the moquddums and the moostajirs; then to detail the principles of subsequent proceedings with respect to putteedaree adjudication and vernacular record of tenures; and then to the condition and prospects of the pergunnah since the settlement.

7.—The extent to which the qualifications that have been fixed by superior authority as the basis of a moquddumee title are possessed by the moquddums of Barah, and the origin and nature of their prescriptive rights, have been fully given in Mr. Alexander's report, and need only be briefly recapitulated. It was held that hitherto the Talookadar had been considered as the *bonâ fide* zemindar; that the titles of Raees, Muhtoo, and Moquddum, which had been accorded to parties other than this Talookadar, did not in reality convey any notion of right to the land; that while a claim to a proprietary tenure independent of

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Talookadar was asserted by only two families, the other claimants to a biswahdaree settlement admitted that their occupancy originated from the gift, with the permission or by the command of the Talookadar, and that therefore a moquddumee title was to be conferred, not on account of inherent or original right, but in virtue of prescriptive occupation. This occupation was found to have been derived through the Talookadar from one or other of five sources: 1*st*, rent-free gifts; 2*nd*, feudal service grants; 3*rd*, direct allocation by the Talooqdar; 4*th*, holding with his sanction; 5*th*, holding in virtue of blood relationship with him. Wherever occupation arising from any of the above causes was found to have been continuous, or nearly so, since the accession of the Company's rule, and that the names of claimants' ancestors had been recorded as Raees in the moazinah anterior to that period, a biswahdaree settlement was made. The two latter conditions were in all cases rendered imperative. It is worthy of remark that, with advertence to the several qualifications alphabetically enumerated in the Government memorandum, Mr. Alexander states his conviction that two important ones, namely, the division of the land amongst the members of the brotherhood according to ancestral shares, and the rights to plant orchards and excavate tanks, did not appertain to any of the claimants before the settlement. I herewith annex* two tabular statements exhibiting the number of moquddumee estates whose occupants belong to each of the five classes above mentioned, and the relative proportion of moquddums to each of the different castes, whether included under the Rajpoot or other denominations.† The orders conferring moquddumee titles on the claimants were issued on the 15th, 16th, and 17th August, 1848. Possession from that date was awarded to the new moquddums in all except 32 cases. In these instances the moquddums, while in possession as farmers, had, with the consent of the Revenue authorities, transferred their leases to other

* *Vide* Appendix 1. † *Vide* Appendix 2.

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parties for various periods, generally in consideration of loans. The periods of transfer were of two descriptions: first, periods concurrent with the term of settlement; second, periods less than the above term. Now, at the outset, a difficulty arose regarding the interpretation of "term of settlement." The leases granted at Mr. Speirs' settlement, made under Regulation VII. of 1822, were to run on for 15 years. At the general settlement of the district made under Regulation IX. of 1833, and commenced five years after the conclusion of Mr. Speirs' settlement of Barrah, it was not considered necessary to re-settle this pergunnah, and Mr. Speirs' arrangements were upheld, and continued for the term of the second settlement. When the Barrah settlement came to be revised in 1848, the extension of period conferred on these arrangements was held to have been illegal, and the term of the leases was ruled to have expired by the year 1848. The expression "*term of settlement,*" therefore, whenever it occurred in the deeds of transfer, was construed in accordance with this definition. Whenever a farmer had, shortly after Mr. Speirs' settlement, transferred his lease "*for the term of settlement,*" then in the event of the farmer being converted into a moquddum the transferree's lease was held to have lapsed, and he was directed to restore the estate to the moquddum. These instances, therefore, did not come within the category of cases in which the according of possession to the moquddums was deferred. But if this rule had been invariably adhered to, some injustice would have resulted. Several transfers had been effected only just before the latter settlement in 1848, for the full term of the 30 years' settlement. It would have been unfair, for instance, that a party who had advanced a large loan to a farmer in the year 1845 on a mortgage transfer of the loan, with the understanding that the transfer would continue as long as the general 30 years' settlement should

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find his lease annulled after three years, *viz.*, in the year 1848. It was therefore determined, in modification of the first rule, that all transfers which had taken place, ostensibly "for the term of settlement," since the year 1844 should be upheld for 12 years after 1848, *i. e.*, the year of the moquddumee settlement. Whenever unexpired transfers were found to have been made for specific periods less than the "term of settlement," they were continued for their several terms. As for instance, a farmer had transferred his lease in 1840 for 10 years; he is made a moquddum in 1848, but his transferree would retain possession till 1850. Such was the solution of the questions relative to the according of possession. I pass on to the proceedings held on those estates, where, no moquddumee tenure having been discovered, farming leases were to be granted. Mr. Speirs' leases having been brought to a termination, re-arrangements were universally made for a period of 12 years from the year 1848, or the year 1256 Fuslee. Where several claims were made for the same lease, regard was had to the relative position of the claimants. The leases granted by Mr. Speirs were discontinued in 52 instances, and other parties introduced. In all these cases the new lessee or his ancestors had farmed the estate in times anterior to Mr. Speirs' settlement, and had been dispossessed on that occasion for one or other of the three following reasons: *1st*, having been absent at the time of settlement; *2nd*, having declined to engage for the assessed jumma; *3rd*, having failed to proffer the requisite security. In cases where the party whose title to a farming lease was approved had, subsequently to Mr. Speirs' settlement, transferred his lease, then the term of transferree's occupancy, and the consequent postponement of farmer's possession, was fixed on the same principles as those followed in the moquddumee cases. This happened in eleven instances. A table showing the castes of the moostajirs is appended.*

* *Vide* Appendix II.

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I shall here close this epitome of Mr. Alexander's proceedings.

8.—It has been already stated that the proceedings conducted after Mr. Alexander's departure consisted in the allotment of shares, the registry of tenures, and the completion of securities. I shall endeavour to describe the course of procedure on each of these three points.

9.—In 59 out of the 92 moquddumee estates a claim for a putteedaree share was preferred before the Native Deputy Collector by one or more persons, in addition to those parties named in Mr. Alexander's proceedings. In fact, Mr. Alexander decided what families were entitled to a moquddumee tenure in what estates; and Meer Muqsood Ally decided which members of the family were to engage, and in what proportions they were to share. I find it impossible to resolve all these putteedaree decisions into a few distinct classes. Such an analysis would amount to an abstract of all the cases, and would swell my report to undue limits. But I can briefly note the subjoined catalogue of qualifications, some or all of which are to be found in every case, and which formed, as it were, the ingredients of which, combined with relationship, a putteedaree title was composed. Relationship or common descent was invariably a *sine quâ non,* in addition to which the following attributes would be looked for:—

1.—Name of claimant or of his ancestor registered in Mr. Speirs' records, and subsequently in Collectors' and Putwarees' papers.

2.—Registration of name of claimant or of his ancestors in records prior to Mr. Speirs' settlement, to make up for absence of name in subsequent records.

3.—Continuous possession of share in profit and loss.

4.—Irregular or partial possession of ditto.

5.—Continuous cultivation of fixed amount at favourable rates.

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6.—Cultivation upon the terms customary in the village.

7.—Possession of tanks, groves, or orchards.

8.—A share in village perquisites.

9.—Ditto in village expenses.

10.—Residence in village, or owning a house there.

I am enabled to offer a description of four classes of proof accepted as sufficient, which may, I believe, serve to exemplify most of the cases, though perhaps there are some few cases which it might fail to embrace. The detail would be exhibited as follows:—

1.—Relationship, together with regular and complete record of share, and with possession in accordance therewith.

2.—Relationship, together with record as before, but possession irregular or partial, such as cultivation, whether fixed or variable, or possession of tanks, orchards, &c.

3.—Common descent with unbroken possession of a share, known, though nowhere recorded.

4.—Common descent, together with cultivation of fixed amount at favourable rates, together with participation in local expenses and perquisites; but share hitherto undefined and unrecorded since Mr. Speirs' time, although ancestors' or relatives' names found in records prior to that date. A somewhat favourable construction was generally put on the circumstances adduced, in cases where the possession of the requisite standard of qualification on the part of claimant was doubtful; and instances have occurred in which the evidence of putteedaree right having been ruled to be defective, the claimant has been allowed the possession of an hereditary cultivator. The accompanying table* will show the proportion of putteedars to lumberdars.

* *Vide* Appendix III.

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10.—With regard to the vernacular record, Mr. Speirs' settlement papers were kept in force, the Native Deputy Collector devoting his attention to the drawing up of new administration papers *(wajib-ool-urz)* for each of the moquddumee mehals, very much after the form prescribed in the model promulgated by Government. I am not able to express my conviction that these papers are universally correct. As they had been previously completed, I did not consider it my duty to formally revise and re-attest the whole. But any error or omission which came to light as the papers came into operation I have caused to be rectified, and several papers lately discovered to be erroneous are now under the process of amendment. The other component parts of a settlement record, such as field maps, *khusreh* and *khuteonee*, had been left as they existed in Mr. Speirs' time. On assuming charge, I caused a great number of the field maps to be tested, and found that though these papers when originally drawn up, fifteen years ago, were doubtless quite accurate, yet that their utility had been greatly impaired on account of the changes in field boundaries produced by the lapse of time. The frequency of change in this respect throughout the pergunnah, specially in the Uperhar villages, and the then impoverished condition of the malgoozars, rendered the propriety of putting them to the expense of a *khusreh* survey questionable; and without the basis of a new measurement it was impossible to effect any radical improvement in the papers, which depend on the field map. But the greatest desideratum seemed to me to be that the village accountants should be able themselves to make such amendments in the maps and *khusrehs* as year after year might become necessary, and thus keep the papers as it were in a state of constant repair and working efficiency. The putwarees have been consequently compelled to learn mensuration, and to entertain the services of

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competent ameens for that purpose. The opportunity will be taken of supplying such alterations in the field map as may be at present necessary. Although hitherto quite uneducated, the putwarees have already made some progress both in learning mensuration and in writing the Nagree character. In connection with the settlement records, I may briefly specify the prevailing tenures. The majority of the moquddumee estates are held under the zemindaree tenure, and the divisions represented by the fractional parts of a rupee. In 15 only out of 92 mehals does a putteedaree tenure exist. In many of the zemindaree estates there is one somewhat peculiar feature: instead of the rents being collected from the cultivators by the lumberdars, the Government jumma paid by them therefrom, and the profits distributed among the putteedars according to their shares, each partner considers himself entitled to collect separately from each cultivator that portion of the rent which would correspond to his fractional share. It is needless to say that this custom is highly detrimental both to cultivator and proprietor, and before long is sure to bring the affairs of the community into confusion. The extensive holding of seer land on the part of the sharers is not easily rendered compatible with zemindaree tenures of this nature; and even when the conditions are fixed, the co-partners are with difficulty forced to adhere to them. Already several estates have been seriously injured by one or both of these two causes, and I have marked out upwards of forty more that are likely to suffer in the same manner. The best, perhaps the only, remedy is partition of the land. It would of course be impossible for the Tehseeldar's establishment to carry out or even supervise so many butwarrahs, but the people may themselves be induced (though they will not readily comply) to employ ameens, and to execute the desired measure.

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11.—The security bonds for the farming estates were nearly all completed before the Native Deputy Collector. The kind of security which had been demanded, from Mr. Speirs' time downwards, had not been such as would now be termed "unexceptionable." It often consisted of moveable and perishable effects, such as cattle, grain, or jewellery; but on the present occasion nothing but immovable effects or real property was accepted. Almost all the moquddumee estates are thus pledged in security, and in fact the two classes of mehals are mutually dependent. When I took charge, towards the close of the agricultural year of 1256 Fuslee, those farmers who had failed to furnish security were called on to do so before the commencement of the showing season, otherwise the Revenue Authorities would make their own arrangements for the ensuing year. From this cause 13 estates were placed under kham management. As the prospects of that season were then gloomy on account of the drought, several malgoozars wilfully allowed their estates to fall into the hands of Government, under the impression that when the present distress was overpast the estates would be restored to them (Government bearing the loss of the bad season, and the proprietor reaping the profits of the good), and were much astonished at finding afterwards that the Revenue Authorities had turned the estates to good account, and declined to resign the management.

12.—It remains to advert briefly to the condition of this pergunnah subsequently to the settlement. It is well known to superior authority that the years 1848-49 were periods of difficulty in Barrah. The heavy balances and the large number of estates which were thrown upon the hands of Government may be in part attributed to calamity of season; but there were other coincident causes which contributed to augment the mischief. The conduct of the malgoozars generally during the year of settlement

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was culpably improvident, and often reckless in the extreme. In April of 1848, when they learnt that an enquiry regarding biswahdaree rights was about to be made, a feeling of uncertainty most unaccountably got abroad; many seemed to imagine that they were about to be deprived of their holding, and proceeded to get all they could from the estates by rack-renting the cultivators, and rigorously collecting all outstanding arrears. Again in June, although a proclamation was issued encouraging them to make arrangements for the cultivation by a promise that no occupant should be dispossessed within the year 1256 Fuslee, those who expected to be displaced by other parties, who would receive a moquddumee title, especially distinguished themselves both by draining the estates of all available proceeds, and neglecting the necessary precautions for the future. In some cases the transferrees, who were retained in temporary possessions (for the reasons given in paragraph 7), grossly abused the indulgence which had been shown them, and when their term expired handed over the villages to the new moquddums in a state of hopeless deterioration; 14 estates were all but ruined by flagrant misconduct of this description. As might be expected, during this period the dykes and embankments were allowed to fall out of repair. The details of the mischief which was occasioned by this neglect I have sketched in a former letter.* But I trust that the tuccavee measures of last cold season, which the Sudder Board has been pleased to sanction, will effectually check the progress of the evil, inasmuch as all existing works will be thereby thoroughly repaired, and a great many new ones erected in elegible localities. I do not, however, mean to say that when all these works shall have been finished, bund-making will have reached its

* No. 193, dated 19th April, 1850.

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limit. The capabilities of the soil for successful experiments in irrigation are great; and if continuous attention is bestowed, it is highly probable that enlargement and improvements may be effected every season. The talookadar in this respect sets a good example to the subordinate proprietors. The estates which he manages himself are some of the best cultivated in the pergunnah, and abound in appliances for irrigation. The following analysis of the various causes which led to the necessity of holding so many estates kham may not be uninteresting:—

Moquddumee.	Estates.	Moostajiree.	Estates.
Default arising from injury by farmer, ...	1	Failure of security, ...	8
Ditto by transferree, ...	3	Death of farmer, ...	2
Ditto from fault of moquddum,	7	Recusancy, ...	1
		Default, ...	13
	11		24
		Grand Total, ...	35

The following figures will show the results of the management of these estates:—

Year.	Jumma.	Jummabundee.	Receipts.
1256 Fuslee, 1848-49, year prior to Kham Tehseel, ...	25,973 0 10	24,650 0 3	18,877 4 2
1257 Fuslee, 1849-50, year of Kham Tehseel, ...	25,973 0 10	22,991 7 2	17,535 2 11
1258 Fuslee, 1850-51, ...	32,375 9 0	30,712 14 1	0 0 0

I beg to offer an abstract* of the various transfers in the moquddumee estates which have taken place since the

* *Vide* Appendix IV.

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settlement. You will observe that the proportion of private transfers is somewhat large, but they are mostly made in favor of relatives, neighbours, or residents of the pergunnah, and comparatively but seldom in favor of bankers. The causes specified in the commencement of this paragraph would partially account for the number of transfers, but it will also be borne in mind that, previously to the settlement, alienation and mutation of lease-holdings were not unfrequent among the farmers, who have now become moquddums.

13.—I beg to subjoin for your inspection certain vernacular papers, which may elucidate some of the subjects touched upon in the early part of this report, together with some historical notes.

NOTE A.

The Rewah territory is universally considered in this part of the country to have been "maâf" during the time of the Mogul empire. The supposition is confirmed by the fact that no mention is made of it in the Ayeen Akbery. It is stated that the Rajah has in his possession a maâfee patent from the Emperor Humaioon. This document, if it really exists, would be of much historical interest, but I have not been able to obtain either an inspection or a copy of it. It is also generally believed, that the mother of Akber was a Rewah princess; that Humaioon when driven from his throne by Shere Shah, took refuge for a time at Rèwah, taking his wife with him, who there gave birth to the Great Akber; that Akber was brought up at that Court, several villages being assigned for his maintenance; and that Humaioon, on recovering the Imperial authority, testified his gratitude to the Rewah sovereign by exempting the kingdom from tribute. Popular tradition has filled up the details of this story, and preserved many anecdotes of

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Akber's childhood. However, the greater portion of this account is undoubtedly mythical, for history speaks clearly as to the birth and parentage of Akber. That Akber's mother might have been a Rewah lady, is not in itself improbable; inasmuch as it certainly was the custom of the Emperors to recruit their harems from the leading Rajpoot families, of whom few were more noble than the Rewah Bughails. But in good truth, Akber's mother was a Mussulman lady, a native of the country beyond the Indus; and many were the troubles which Akber subsequently had with his relatives on the mother's side. Thus much is clear from the biography of Humaioon and of Akber. Further, there can be no doubt for authentic history, that Akber was born at Amerkote near Sind. Moreover, as it appears from the same authorities that Humaioon was accompanied by his wife and son in his wandering to Persia, it is difficult to understand when they could have fled to Rewah, and for what reason. I am unable to say, how, when, or wherefore Rewah became rent-free, but it is manifest that the common version of the matter is erroneous.

NOTE B.

I have stated that Pergunnah Barrah was included in the Sirkar of Bhutghorah on the authority of Sir H. Elliot's glossary; but even that work does not contain much information respecting the territorial divisions connected with this pergunnah. In fact, there are few parts of these Provinces regarding the early history of which less is known. In the Ayeen Akbery the gross revenues and the number of mehals in Bhutghorah are merely given; the names of the mehals are not specified. If Barrah was included in this Sirkar, it must have ceased to belong to Rewah, especially if the latter territory were maâf. But

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at all events, after the downfall of the empire, it would seem that Barrah reverted to Rewah, for the glossary states that "Barrah was under the Rewah Rajah till the time of Asoof-ood-dowlah." It is generally believed in the pergunnah that the Nawab Wuzeer's authority was established there previous to the time of Asoof-ood-dowlah; that the Barrah Bughails wishing to throw off their allegiance to Rewah, and to secure to themselves proprietary possession, sided with the Nawab Wuzeer in order to gain these two ends, and offered to pay a small tribute; that the Nawab Wuzeer accepted this offer, protected them from Rewah, confirmed them in their zemindaree position, and subsequently augmented the small tribute into a regular jumma. However, this may be, there are complete accounts of the contest between Asoof-ood-dowlah and the Rewah Rajah, from which it certainly would seem that Barrah was then for the first time fairly annexed to the Oudh dominions. The result of this border warfare I have given in the body of the report. Its details are graphically described in a Persian statement presented to me by a native gentleman, whose father was Mr. Osborne's Naib throughout the transactions alluded to, and his agent in the farming arrangements which followed. The letter of acquittance which he received from Mr. Osborne at the expiry of the lease has been preserved by his son in original, and I have kept a copy of it. I should add that the Persian statement was drawn up by the Moonshee who attended Mr. Osborne, and is in the possession of the author's grandson.

NOTE C.

In speaking of the vestiges which remain of the Bhur race, I particularly allude to the ruins of a fort at Bheetah, and of a fortified palace near Sheorajpore. The latter can

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boast of much architectural merit. The Bhurs are said to have been in possession both of Barrah and of Kayragurh (the latter of which they held under a feudal tenure) in the palmy days of the Kanouje kingdom, and especially during the reign of Jeychund, the last of the Kanouje Rajahs. After the dismemberment of this great kingdom, it is supposed that the invasions of the Rajpoots from Bughailkhund took place.

NOTE D.

The Bughail race is an off-shoot from the stem of the Soulankis or Chalooks, who founded the kingdom of Auhulwara, "the Venice of the East." The Bughails reigned in that famous city during the period which intervened between the invasions of Shahoob-ood-deen and Alla-ood-deen. After this second disaster, and the final destruction of Auhulwara and Somnath, the Bughails emigrated to that part of Hindoostan which was afterwards called Bughailkhund, and the capital of which is Bandoogurh (*vide* Tod's Rajasthan, Chap. VII.) There is an idle legend, similar in form to that of Romulus or Œdipus, current in this part of the country regarding the origin of the name Bughail, to the effect that one of the princes of Rewah was exposed during his infancy in the woods, and was nourished by a tigress *(baghun)*; hence the name Bughail.

APPENDIX I.

Statement showing the origin of Moquddumee possession.

No.	Denomination of Holdings.	Number of Estates.
1	Rent-free gifts of Talookadar, ...	6
2	Feudal service grants of ditto, ...	25
3	Direct allocation by ditto, ...	19
4	Holding with Talookadar's sanction, ...	10
5	Holding in virtue of blood relationship with Talookadar,	32
	Total, ...	92

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APPENDIX II.

Statement showing the Estates in possession of different castes in Pergunnah Barrah.

Number of Villages in possession of occupants previously to formation of Talooka.	Number of Villages which have come into possession of occupants since the formation of Talooka.	Name of Castes.	Description of Castes.	Detail of Estates. Moquddumee.	Farms.	Total.
		Rajpoot, ...	Bunapur, ...	2	0	2
		Ditto, ..	Byse, ...	2	2	4
13	0	Brahmin, ...	Chowdry, ...	2	0	2
		Ditto, ...	Sookul, ...	2	0	2
		Kayeth, ...	Sreebastub, ...	1	2	3
				9	4	13
		Rajpoot, ...	Bughail, ...	32	22	54
		Ditto, ...	Byse, ...	8	4	12
		Ditto, ...	Pureehur, ...	3	2	5
		Ditto, ...	Loodail, ...	3	1	4
		Ditto, ...	Kuchwa, ...	0	1	1
	87	Ditto, ...	Bhuddureah, ...	2	0	2
		Ditto, ...	Chundail, ...	1	0	1
		Ditto, ...	Khuraith, ...	1	0	1
		Ditto, ...	Taysuheea, ...	1	0	1
		Ditto, ...	Guhurwar, ...	0	2	2
		Ditto, ...	Besain, ...	2	0	2
		Ditto, ...	Chowhan, ...	2	0	2
				55	32	87
		Brahmin, ...	Misser, ...	4	1	5
		Ditto, ...	Ojha, ...	0	8	8
		Ditto, ...	Tewaree, ...	2	16	18
		Ditto, ...	Chowbey, ...	2	1	3
		Ditto, ...	Panday, ...	1	3	4
	52	Ditto, ...	Opadhia, ...	0	5	5
		Ditto, ...	Doobey, ...	3	3	6
		Ditto, ...	Pattuck, ...	0	2	2
		Ditto, ...	Sumoodureea,	1	0	1
				13	39	52

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APPENDIX II.

Statement showing the Estates in possession of different castes in Pergunnah Barrah.—(Concluded.)

Number of Villages in possession of occupants previously to formation of Talooka.	Number of Villages which have come into possession of occupants since the formation of Talooka.	Name of Castes.	Description of Castes.	Detail of Estates. Moquddumee.	Farms.	Total.
		Kayeth, ...	Sreebastub, ...	3	5	8
		Ditto, ...	Ustanna, ...	1	1	2
				4	6	10
	19	Koonbee, ..	Koonbee, ...	7	12	19
	2	Burgahee, ..	Burgahee, ...	1	1	2
	1	Kachee, ...	Kachee, ...	0	1	1
	1	Aheer, ...	Aheer, ...	0	1	1
	1	Looneeah, ...	Looneeah, ...	1	0	1
	1	Goshaen, ...	Geer, ...	0	1	1
	2	Mussulman, ...	Puthan, ...	0	2	2
	27					
				9	18	27
		Number of Villages in which different castes in possession.	...	2	34	36
		Grand Total, ...	...	92	133	225

APPENDIX III.

Statement showing the proportion of Putteedars to Lumberdars.

Number of Lumberdars.	Number of Putteedars.	Average of Putteedars to one Lumberdar.
188	336	2

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APPENDIX IV.

Statement exhibiting the number and description of transfers which have taken place in Moquddumee Estates since the Settlement.

MUTATIONS.				SALE.		FARMS.		KHAM TEHSEEL.					REMARKS.
Hereditary Succession.	Private sale.	Mortgage.	Private Transfer.	Decree of Civil Court.	Arrears of Revenue.	Farms.	Transfers.	On account arrears of Revenue.	On account failure of security.	Death of Farmer.	Recusancy.	Total of all kinds.	4 Estates pending sale on account of decree of Court. 8 Ditto ditto arrears of revenue.
7	6	10	2	8	1	5	4	11	0	0	0	54	12

No. 6.

SETTLEMENT OF THE PESHCUSH MEHALS, ZILLAH JOUNPORE, 1852.

I.—*From* C. B. THORNHILL, ESQ., *Officiating Secretary to Government, North-Western Provinces, to* W. H. LOWE, ESQ., *Officiating Secretary to the Sudder Board of Revenue, North-Western Provinces; No. 2419A.—Dated Agra, the 27th December, 1856.*

REVENUE DEPARTMENT.

I AM directed to acknowledge the receipt of the Senior Member's Memorandum, No. 2A., dated the 10th instant, transmitting the Settlement Reports of the Peshcush Mehals, with their Appendices, compiled and submitted by Mr. M. C. Ommanney, Collector of Zillah Jounpore, and approved by His Honor the late Lieutenant-Governor, on the 10th December, 1852.

2.—In reply, I am desired to intimate that the Lieutenant-Governor will have much pleasure in placing these interesting papers (which appear to have been accidentally lost sight of since the early part of 1853) on the records of Government, and in printing them in a separate collection of official papers as one of the selections from the records of this Government.

3.—In addition to the papers selected by the Senior Member, and marked in the list referred to in his memorandum, an extract from pages 425 to 429 of the decision of the Sudder Dewanny Adawlut, of 17th July, 1855, in the case "Syud Tussudooq Hossein Khan *versus* Madho Singh and others," will also be published in this collection, showing succinctly and clearly the grounds on which the decisions of the Revenue Officers on the question of title as between the peshcushdars and inferior landowners have been upheld by the highest Court.

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4.—Those decisions have the entire approval of the Lieutenant-Governor, and he considers the investigations and proceedings on the subject to have been highly creditable to the diligence, impartiality, and judgment of the then Collector, Mr. Ommanney.

II.—*Order of His Honor the late Lieutenant-Governor on the Settlement Reports of the Peshcush Mehals; 10th December, 1852.*

Mr. Ommanney's proceedings are approved. The Commissioner should give a note combining the separate reports together, and the whole can then be published.

III.—*Note on the Settlement of the Peshcush Mehals in Zillah Jounpore, by* E. A. Reade, Esq., *Commissioner of the Benares Division, 23rd March, 1853.*

The peshcush mehals now wholly included in Zillah Jounpore, in part consist of a portion of the Buksheeat, which comprised estates both in Jounpore and Azimgurh, and in part of estates scattered through Pergunnahs Huveylee, Oonglee, Kerakut, and Ghiswa.

2.—The produce of the former was devoted to the maintenance of the garrison at Jounpore; and the population, mainly consisting of Rajpoots and a few Beloochees, in all probability furnished the soldiers.

3.—The commandants, munsubdars, and officers of the Imperial Court at Dehli received assignments of fixed amounts for the support of their dignity on the Bukshee or Paymaster of the Force, who collected the revenue, and whose title gave the name to the tracts above-mentioned.

4.—Some of these munsubdars, either of favour, or as reward of service, or in lieu of arrears, received jagheers in the Buksheeat, from whose heirs and successors the

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Nawab Wuzeer, and his vassal, the Rajah of Benares, exacted a peshcush or tribute, or quit-rent.

5.—The privileged incumbents of the other estates, who derived their titles from the same Imperial authority on personal grants, or as trustees of endowments for religious or educational purposes, were subjected to similar exaction.

6.—Mr. Duncan, respecting the tenures of incumbents on the ground of "ancient precedent, considered it sufficient to exact the customary peshcush," the amount of which became fixed at the permanent settlement, though no interchange of puttah and kaboolyut was made.

Clause 8, Section 17, Regulation II., 1795.

7.—The claims of proprietary right, generally urged by the peshcushdars at comparatively recent dates, received no kind of recognition from Mr. Duncan. His intervention, on the question of jumma payable to the peshcushdars, was solicited in only one instance (Kuttehree), and in that the right of the subordinate village proprietors was acknowledged as a matter of course, and the amount of jumma fixed. The oldest register extant, it may be observed, contains, under the heading of "under-renters," a term used by Mr. Duncan to describe village proprietors and farmers from the aumil (see Section 10, Regulation II., 1795), the names of persons whose relationship to the village proprietors recognized can be traced in almost all instances.

8.—Prior to the enactment of Regulation VII., 1822, there was occasional litigation between the peshcushdars and village proprietors on the point of right. The Courts generally decided that the peshcushdar had the right to fix the demand of revenue, but was bound to give a malikana to the proprietor in the event of his recusancy and exclusion.

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9.—From defective registration, little was known as to the names, number, and extent of the mehals subordinate to the peshcushdars. There is doubtless good reason to suspect that both the title was too readily admitted, and that lands have been included under peshcush, which ought to have been settled as other malgoozaree tenures.

10.—But the investigations of the officers appointed to conduct proceedings, under Regulation II., 1819, preliminary to the approaching survey, elicited no sufficient proof of surreptitious acquisitions, and the validity of present titles and actual tenures rests on final awards of that officer and the Special Commissioner, under Regulation III., 1828.

11.—The survey and settlement followed on this enquiry; but under orders of the Government of the day, the settlement officers employed in the province of Benares had only a limited jurisdiction, and this was considered to have been exceeded by Mr. Chester, who took measures to define the rights, and to determine the contracts between the village proprietors and peshcushdars.

12.—Tussuddooq Hossein Khan, Principal Sudder Ameen, one of the largest holders of the privilege, protested against his proceedings to the head of the Government; they were in consequence cancelled, and further proceedings postponed until "special necessity and distinct sanction" should obtain.

Board's Orders, No. 121 A., 6th May, 1842.

13.—The remedy of much previous error, and the prevention of greater evils, was thus barred. With few exceptions, the disappointed village proprietors on the one side, and the exacting peshcushdars on the other, became exasperated. The former were combined and daring, the latter plied every legal engine. The revenue officers were bewildered, and by an extraordinary misapprehension of the rule, that ordinarily there should be a

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single putwaree for the mehal, removed the putwarees of extensive talookas to substitute one for each talooka. The most trustworthy evidence in controversies was thus set aside, and in several instances the village papers were nothing but a fabulous compilation, made up or signed by a putwaree, who never went near any one of the numerous mehals designated in the papers.

Commissioner, to Sudder Board of Revenue, dated 16th June, 1849, No. 145.

Sudder Board of Revenue, No. 176, dated 3rd July, 1849.

14.—This state of things was represented, the previous prohibition withdrawn, and Mr. Ommanney being invested with powers of Settlement Officer under the Government Notification, 12th September, 1848, was charged with the duty of defining rights in possession, and, where circumstances warranted the course of giving effect to the provisions of Section 17, Regulation VII., 1822.

15.—This duty has been discharged under not easily appreciable difficulties, arising from his being the largest share in the administration, and reformation of a long-mismanaged district, from the scattered position of the mehals, the necessity of entire re-measurement and re-compilation of settlement record, the grievous errors committed by his predecessors, the bitter hostility of parties, the unreasonable expectations of those who had been oppressed, the opposition and intrigues of those who had spared no device to extinguish the rights of others, and the interruption caused by loss of health, which compelled him to quit the country.

16.—The enquiry also involved several intricate questions, some of which it was necessary to refer to the Board and Government,* both on the point of right and fixity of jumma payable; appeals may literally be said to have been rained down, but in

* See case of Chokeepoor in Mehal Imlo Sooltanpoor, and Kooluntmow, of Mehal Kooluntmow Bijyepoor.

scarcely a single instance was it found necessary to amend the judicial award of proprietary recognition, and in only a very few cases the question of fair jumma elicited a difference of opinion.

17.—Certainly no settlement officer's proceedings have been subjected to closer scrutiny. The re-measurements were carefully tested by Mr. Ommanney himself, the conflicting claims of parties were adjudicated in the locality or neighbourhood, the coparcenary tenures clearly defined, and the compacts for future management drawn out in conference with all parties interested; wherever the amount of jumma could be amicably adjusted between the village proprietors and the Government assignee, it has been accepted, and in other cases either the standard has been assumed from trustworthy accounts in a few instances, and on substantial evidence of fixed unvarying payments; or where accounts were obviously false, fair demands have been determined by reference to border position, to the rates of the Government assessment in neighbouring estates, held by similar proprietary communities, and on estimates of existing assets and prospective capabilities.

18.—With the same care and precision the rights of parcel holders and proprietary cultivators have been defined, and the village rent-rolls in all cases have been publicly tested. The putwarees' offices have been placed on a proper footing, and allowances provided for the rural police.

19.—Mr. Ommanney's performance of this difficult duty has deservedly entitled him to the marked approbation of Government.

20.—It was impossible to combine into one Settlement report all the peculiar and diverse features of these mehals, and hence the submission of separate settlement reports, which need only a brief notice, the preceding observations

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being applicable to each and all of the mehals subject to settlement operations.

21.—Talooka Soentha. This extensive talooka, comprising twenty-seven villages and a chuk, was originally assigned for military service. The peshcush privilege was held by two branches of the family, who acquired the jagheer from the Delhi Court, of which Tussuddooq Hossein abovementioned now enjoys two-thirds. The remaining one-third has passed, by sale of Ahmud Hossein Khan's rights, to the Jounpore Doobey family, who also purchased the proprietary right in a portion at similar sale of village owners' rights. This fact is of itself evidence against the absurd pretensions of Tussuddooq Hossein Khan, that the peshcushdars have always held absolute proprietary right.

22.—The various devices which have been resorted to in order to extinguish the rights of the village owners are detailed in Mr. Ommanney's report. But neither the expedient of direct management, elicited from a former Collector, nor the abolition of the former putwarees' offices, nor the confusion of contradictory orders from the revenue functionaries, nor varied efforts of litigation in the Civil Courts, have compassed this result. The evidence of continued proprietary possession is ample; it has been fully arrayed and recorded in answer to the claims and special pleading of the principal peshcushdar, and will bear the severest tests of judicial investigations to which it will be subjected in the Law Courts.

Note.—The Sudder Dewanny Adawlut, printed Decision, 17th July, 1855, page 423, have maintained the Settlement Officer's award.

23.—The village jummas, the fairness of which has been strenuously canvassed by the same objector, upon no better ground than a fabulous compilation of accounts by a servant, under the name of putwaree, have been fixed on the principles stated in paragraph 17 of this note. There is

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evidence that the whole revenue paid by the village proprietors for the talooka in 1790 did not exceed Rs. 4,065-13-3, and that Tussuddooq Hossein, for his portion, never realized more than Rs. 3,400, so that by the Collector's assessment he is actually a gainer, as he will now derive Rs. 4,054-12-0. The other peshcushdar, who, as above stated, is, by right of purchase, proprietor of Bulwunt puttee, will receive Rs. 3,705-8-3. The former proprietors have never been ousted from possession, but Mr. Ommanney has rightly considered that they should pay in lieu of this concession a somewhat increased jumma to their superior. No objection has been made by either party.

Paragraph 63.

Paragraph 67.

24.—The village proprietors are mostly of the Raj Koomar tribe, whose possessions are extensive in the adjacent portions of Oudh. They practise infanticide, but have entered into engagements to relinquish this horrid usage, and their adherence to the promise should be enforced by the continued exhibition of personal interest which Mr. Ommanney enjoins on his successors, and a rigorous surveillance, of which, apart from other considerations, the redress of their positive grievances leaves them no reason to complain.

25.—As a temporary measure the village proprietors have been allowed to pay the jummas of the principal peshcushdars' portion at the tehseeldaree.

26.—Hajeepoor, Palpoor. This comprises two mehals, which appear to have been assigned for educational purposes originally, and subjected subsequently to peshcush. Hajeepoor appears to have been originally the property of certain Chohan Rajpoots, who have long sunk to the grade of privileged tenants, and as such their tenures and privileges have been duly recorded. The Beis proprietors of

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Palpoor have been more successful in resisting the usurpation of the peshcushdar, and being in proprietary possession, recognized by decision of the Provincial Court of Appeal of Benares, settlement of the estate has been made with them. The peshcushdar has, however, sued for cancelment, and obtained a decree from the Principal Sudder Ameen, which has been reversed on a technical objection in appeal.

Note.—The suit was re-instituted, and finally disposed of by the Sudder Dewanny Adawlut. 6th September, 1855, printed Decisions, page 575, maintaining the Settlement Officer's decision.

27.—IMLO SOOLTANPOOR. These mehals, which comprise eleven scattered mouzahs or parcels, appear to have been assigned also for educational purposes connected with the great mosque of Jounpore. The tenure of the family who obtained the grant, now divided into two branches, appears undoubtedly ancient, and though resumed in first instance, was released in appeal by the Special Commissioner.

28.—Some of the components of these mehals, such as Ekonah, Chokeepoor, Larlepoor, and Phagoopoor, are parcels of land within the limits of permanently settled malgoozaree estates, the proprietors of which have maintained their ancient rights against usurpation. In others, the peshcushdars have overborne these rights, and reduced the proprietors to the grade of tenants holding at fixed rates. These have been duly secured, and proprietors in acknowledged possession of whole villages or parcels admitted to engagements at fair jummas. The case of Chokeepoor, on the point of fixity of jumma was referred to Government, and disposed of on the principle declared in the orders issued.

See paragraph 16, above.

29.—BHADEE MHOWYEE. These mehals, like Soentha, were originally assigned in support of the garrison at

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Jounpore. Their components, twelve mouzahs, are scattered; and Mr. Ommanney apprehends that the jagheer, subject to peshcush by the Native Government, has been enlarged by subsequent usurpations. But no sufficient evidence was obtained in the investigations under Regulation II., 1819, and the existing status does not now admit of question.

30.—Bhadee is the family residence of the peshcushdars, and contains Bazar Shah Gunj, which includes portions of four villages. It appears to have been established by the Nawab Vizeer Shòoja-ood-dowlah, and to have been the head-quarters of authority. Its name was given to an old local* jurisdiction, long obsolete. Hence it was assumed that it was an escheat to the State, but after the fullest investigation, this claim could not be maintained. The proprietary right in Bhadee is complicated by the circumstance that some of the members of the same family have the right to the peshcush privilege, and the proprietary right also; others, the latter only. The record is clear and precise, and its details have not been disputed.

* Clause 5, Section 4, Regulation VII., 1795.

31.—Myaree has been settled with the Trigo Naith proprietors upon a fair jumma; Mr. Ommanney's orignal award, recognizing a jumma of less amount, which had been shown by judicial award to be founded on a spurious deed, having been amended.

32.—The questions relating to the components of Mhowyee have been few. Where village proprietors have been found in possession, these have been admitted to engagements, and in other cases the privileges of cultivators at fixed rates have been secured.

33.—Kooluntmhow Bijeypoor. This mehal comprises two mouzahs, assigned for military service, as in the preced-

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ing case. Kooluntmhow was originally property of Rykwar Rajpoots, who have been overborne by the peshcushdars, and have sunk to the grade of arazeedars or parcel-holders, and cultivators paying fixed amounts for the land they cultivate. The former were subject of some difference of opinion, and reference to Government. The result is, that these descendants of the old proprietors retain their parcels free of rent, and the fair rent of other holdings has been fixed.

See paragraph 16, above.

34.—In Bijeypore, the proprietary right of Rajpoots of the same tribe, and the fixed sum payable, has been acknowledged without dispute.

35.—Pygeepoor Telochunpoor. This mehal comprises four mouzahs, and was, it is believed, an endowment of the Serai Meer, in Azimgurh. The peshcushdars have been acknowledged proprietors in the absence of proofs of the right of other parties, but certain Patuck families in Beerbhanpore have been retained in possession of their privileges of payment of a fixed sum and enjoyment of a moiety of the sayer.

36.—Zumeen Sepah. This is only a small plot of land, very valuable, from its proximity to the town of Jounpore: it appears to have been part of the endowment of Mukhdoom Shah, a saint of celebrity. The peshcushdars have the absolute proprietary right.

37.—Bhynsnee. Bhynsnee with Hurryepoor, which last is a small tract, appears to have been originally an endowment of the Serai Meer shrine abovementioned, under Pygeepoor Telochunpoor. Gopalapoor appears to have been incorporated with one moiety of the original mehal by a fraud, but it is included in it in the decennial settlement, and proof of the suspicion is unattainable. The Beis Rajpoots, who held Gopalapoor in former times, pay a fixed

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sum for their actual holdings, and in other respects the peshcushdars are proprietors of both of the two mehals recognized by Mr. Duncan.

38.—Suhujwaro Gobindpoor. This is not a peshcush mehal recognized by Mr. Duncan, but it has been resolved into that category by a decision of the Special Commissioner. The peshcushdars are sole proprietors.

39.—Kutehree. This single mouzah is said to have been assigned for the solace of travellers. The right of the zemindars was recognized by Mr. Duncan, and, the jumma also fixed by him. This has been slightly enhanced by an additional nuzzurana, long paid, and with consent of parties, has been maintained.

40.—Bureiya Quazee. The peshcushdar's privilege appears to have been bestowed on the Quazee, and to have been retained by his descendants, irrespective of official duties. Mr. Ommanney considers that the peculiar class of cultivators, Burhyees or Tumbolees, who cultivate pawn gardens, were original proprietors; and although not in possession of the whole estate, he acknowledged their right to thirty-six beegas of land, and certain orchards. One of these having been sold subsequently, the peshcushdar has sued and obtained a decree for the manorial privilege of one-fourth of the sale proceeds. As this is a common usage, there appears to be no sufficient ground for condemning the decision of the Court.

41.—Kuranja. This appears to have been a religious grant originally; the peshcushdar is sole proprietor.

42.—Uttrora. The peshcush belongs to a member of the Soentha family, and the origin of the tenure is probably the same. The proprietary right was claimed by certain Bissein Thakoors in the Civil Court, and disallowed, doubtless from a misapprehension. It was impossible,

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therefore to, admit them to engagements; but the amount of rent payable for the lands they hold has been fixed and recorded, and the present arrangement, under which these Thakoors pay on their own account, and collect from other tenants in behalf of the peshcushdar, has not been interfered with.

43.—KHUREEAON, &c. These mehals comprise ten villages, some of which Mr. Ommanney considers to have been surreptitiously included in the peshcush mehal recognized by Mr. Duncan. The resumption of the Deputy Collector's award was, however, set aside by the Special Commissioner, and the question does not now admit of being raised. The grant, whatever it contained, was probably a reward for judicial services, and the descendants of the family adhere to that profession.

44.—There are three mehals held by distinct branches of the family of the original grantees, or persons represented as such. The component mouzahs were formerly held by Rajpoot and Brahmin proprietors, whose deprivation of their rights is stated to be mainly owing to the selection, by the Collector, of Mr. Barwise, as sezawal during the period they were under attachment under the award of resumption subsequently reversed. The Bithoria Rajpoots have, however, contrived to retain ninety-nine beegahs of nankar land in mouzah Medhpore, which have been secured to them; and in other cases, the demand on the lands they cultivate has been permanently fixed. In the case of Jooroopore, certain persons, styled Bijhonia Rajpoots, hold as lessees and mortgagees, but there is no sufficient evidence of proprietary right.

45.—A general statement for all the abovementioned mehals, with statements of their population and description of the nature of the proprietary tenures, has been compiled by Mr. Ommanney as appendices, for general reference, with a specimen of wajib-ool-urz or campact of management.

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No. 7.

SETTLEMENT OF PERGUNNAH SUKRAWAH, ZILLAH FURRUCKABAD;

WITH DETAILED REPORT ON THE PROPRIETARY RIGHT IN EACH VILLAGE.

From J. THORNTON, ESQUIRE, *Secretary to Government, North-Western Provinces, to* H. M. ELLIOT, ESQUIRE, *Secretary, Sudder Board of Revenue, North-Western Provinces,* No. 3709.—*Dated Agra, 23rd August, 1844.*

SIR,—I am desired by the Lieutenant-Governor to request you will lay before the Sudder Board of Revenue the accompanying copy of a petition from a person calling himself Ishree Singh, zemindar of Mouzah Mudhee, Pergunnah Sukrawah, Zillah Furruckabad.

2. The Lieutenant-Governor finds that, when the late Marquis of Hastings visited these Provinces in 1814-15, he placed on record, under date 21st September, 1815, the following remarks on the subject of such petitions as this:—

" *Para.* 138.* The situation of the village proprietors " in large estates, in farms and " jagheers, is such as to call loudly " for the support of some legislative " provision.

* Report of House of Commons, August 16, 1832, Vol. III., Revenue Appeal, pp. 83, 85.

" *Para.* 139. In Burdwan, in Behar, in Benares, in " Cawnpore, and indeed wherever there may have existed " extensive landed property at the mercy of individuals, " whether in farm, in jagheer, in talook, or in zemindaree " of the higher class, the complaints of the village zemin- " dars have crowded in upon me without number; and I " had only the mortification of finding that the existing

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"system established by the legislature left me without "the means of pointing out to the complainants any mode "in which they might hope to obtain redress.

"*Para.* 151. In both these *istumraree* tenures and "jagheers, however, all that Government could make over "were the rights possessed by itself; so that it was incum- "bent upon the assignees to be guided in their conduct, "towards the subjects of Government transferred to them, "by the same rules and principles of action as regulated "the proceedings of Government."

Appendix as above page, 100.

3. The Honorable Court of Directors subsequently, in their letter to the Government of Bengal, dated January 15th, 1819, para. 65, wrote as follows: "Per- "fectly agreeing with what is stated by the Board of Com- "missioners respecting the jagheers (which corresponds "with the view taken of the subject by Lord Hastings) "that 'nothing in the terms of any grant, either by the "British Administration or by former Governments can "be interpreted to preclude the enactment of any laws "which may be deemed expedient for the protection of "the zemindars and ryots in jagheer lands,' we are de- "cidedly of opinion that a Regulation should be passed "declaratory of that right in the Government, and that "the same measures may be adopted within those lands, "for ascertaining, adjusting, and securing the rights of "the ryots and all others below the Jagheerdar, (and indeed "in all instances where the public Revenue from land may "have been assigned to individuals whether on Mocurrery "or other more limited tenures) as you may deem it ne- "cessary to pursue in the zemindaree lands in general."

4. The legislature of the country, influenced by this most forcible statement of the case, enacted Section 6, Regulation IX., 1825, and thereby deprived the Govern-

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ment of the plea which it formerly advanced, of inability to redress wrongs of this nature.

5. The Lieutenant-Governor considers it impossible to put the injustice of refusing redress stronger than the petitioner has himself placed it in the accompanying representation.

6.—The Board are requested to furnish a report on the real merits of the case, *i. e.,* whether or not the petitioner and his brotherhood are the real zemindars or proprietors of the land, and have been dispossessed of their proprietary right by a Jahgeerdar, who was only the assignee of the rights of the Government in the land. In the event of their finding such to be the case, they will report what measures they propose for restoring to them the rights of which the petitioners complain that they have been dispossessed.

I am, &c.,

J. THORNTON,

Secy. to the Govt., N.-W. P.

Agra, the 23rd August, 1844.

Extract of a Letter addressed as above, No. 3065; dated 11th July, 1845.

2.—The state of the law applicable to caes like this has been already explained in my letter of January 3rd last. The only question which can arise is, whether the circumstances of this case are such as to call for the exercise of the powers vested in revenue officers by Section 6, Regulation IX., 1825.

3.—The rent-free grant of Sukrawah is no old tenure of uncertain origin, where a long prescription, prior to our acquisition of the country, may have created rights which

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we are bound to respect. The grant was made by the British Government itself, when the country came under our rule. The Government could give no more, and intended to give no more, than they possessed themselves. If in that pergunnah there were hereditary proprietors of the land, entitled either to engage for the land, or to be compensated (by nankar or malikana, or in any other way) or their exclusion from the management, the Government are bound, in justice to their subjects, to provide that these rights be not subverted by their act. During the lifetime of the original Jagheerdar, Nawab Ameen-ood-dowlah Khirudmund Khan, it seems that the rights of all proprietors were respected.

4.—It was after his death in 1826, and the subsequent admission of his heirs, that the encroachments began. The aggrieved parties tried to bring their case before the Courts, but failed from the want of adaptation in the forms of our Courts to the trials of such cases, and from the inability of all parties to bring the question to a fair issue. The suits were thrown out on immaterial points, and the real merits of the case left unaffected. The plaintiff failed, not from a direct negative of his right, but from a declaration of inability to try and define the right.

5.—The plaintiff has now urged his rights in the strongest possible terms, and has, repeatedly since the first petition, been pressing his claims upon the Government.

6.—The Lieutenant-Governor is at a loss to discover any grounds on which he would be justified in refusing the solicited remedy, and I am therefore desired to communicate to you the following instructions :—

7.—The Revenue Authorities in Furruckabad are vested with special powers under Section 6, Regulation IX. of 1825, for the investigation and decision of all rights in the rent-free estate of Sukrawah.

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8.—As soon as may be practicable, the Collector will mark off the boundaries of the 37 villages constituting the talooqua, and will measure them by Ameens. The cost of this will be in the first place defrayed by Government, and may be charged in a contingent bill, but may probably be hereafter recovered either from the village residents or the Jagheerdars. When the survey is completed, the Collector will proceed to ascertain, define, and record the rights which he may find existing in the villages. The principles involved in this enquiry will be found generally set forth in paras. 77, 81, 105, 109, 116, and 117 of the directions for Settlement Officers lately promulgated.

9.—It is by no means desired in this case that the rights of persons claiming proprietary interests be strained to an undue extent, and the maâfeedars deprived of what they have long held in unquestioned possession. The state of things which was found to exist in the talooqua when it came under management of the Government officers, on the demise of Nawab Ameen-ood-dowlah in 1826, may be the general criterion of right. Where the Collector may be of opinion that a right clearly exists on the part of the village proprietors to engage for the land, he should endeavour to arrange between them and the maâfeedars the terms of a lease; and failing that, should settle the amount of do-biswaee land, or of malikanaa, to which they are entitled. He should also be careful to determine who are the parties having such right, and the share in each. Where there are no proprietary rights, *jummabundees* declaratory of existing rights of occupancy and rates of payment, should be prepared in the usual manner.

Memorandum regarding the Jagheer of Pergunnah Sukrawah.

Pergunnah Sukrawah has now been measured, the nature of the existing rights has been ascertained, and the assets

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of the several component villages have been roughly determined. It remains to lay down the course of proceeding to be followed, and the principles to be observed in adjudicating on the rights of the inhabitants of the jagheer.

The enquiry is conducted under Section 17, Regulation VII., 1822, which empowers the Settlement Officer "to de-"clare who possess, or are entitled to possess, a hereditary "and transferable property in the land;" and either to conclude a settlement with them on behalf of the Jagheerdars, or to fix the amount of nankar, or proprietary allowance, to be given them by the Jahgeerdars.

The villages thus naturally fall into three classes.

First,—Those where a Settlement is to be made with the proprietors.

Secondly,—Those where nankar is to be given to the proprietors.

Thirdly,—Those in which no proprietors at all are found to exist.

It will be useful to lay down a few principles to determine which mouzahs should fall into each class, and to fix the conditions on which they will be held.

1*st,*—*Those mouzahs in which a settlement is to be made with the proprietors.* Wherever there is a community of resident proprietors, who are entitled to divide amongst them the profits of the village, and who, whenever the village has been held in *theeka* by one or more of their members, have shared the profits with the theekadar according to the village custom, a settlement should be formed with the proprietary community. It matters not whether the community have divided the land amongst them, or have not so divided it. The point to be looked to is, whether the theekadars, who engaged with the Jagheerdar, acted simply on their own

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account, or as the representatives of a community. The settlement must be made in the same way as if the village were khalsa, except that more care will be requisite in fixing the jumma. This should be fixed at 70 per cent. of the average produce of the *mulgoozaree* land, (afer deducting minhai) during the last five years, or for as much longer as the produce can be ascertained. By the last clause of Section 17, Regulation VII., 1822, the amount of jumma is a point which the Civil Courts cannot take cognizance of. The new jumma should commence from the beginning of the next khurreef (notwithstanding existing contracts of a different tenor), and have currency for the same period as the rest of the district, which will shortly be determined by a forthcoming law. The *kists* should be the same as in the neighbouring khalsa villages. The *misl* must be completed in all respets in the same way as in khalsa villages, and the greatest care will be requisite in drawing up the *wajib-ool-urz*, so as to prevent disputes in future amongst the sharers. The proprietors should be called zemindars; the engaging proprietor, lumberdar; and the rest, putteedars.

2nd.—*Those mouzahs in which nankar is to be given to the proprietors.* Wherever there is no community of proprietors, but certain persons are found, resident in the village or other-wise, possessed of or entitled to possess, proprietary rights in their own persons, whether or not they have uniformly, or generally, held a *theeka* of the village, they should have assigned to them a nankar in land (otherwise called do-biswaee), the rental of which shall be equal to 1-10th of the rental of the whole village. Where there are more than one person entitled to nankar, the allowance should be divided between them according to their rights. It should generally consist of their *seer* land, or if such cannot be given them, of other land lying conveniently for them; whereas in Muraee, there is old nankar land, of

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which the proprietors long held possession, but from which they have been wrongfully dispossessed: it should be restored to them. The nankar thus assigned to each proprietor, will be held rent-free as his heritable and transferable property, over which the Jagheerdar will have no power. If the village is farmed to another than the nankardar, the nankar land must be excepted from the farm. This arrangement will not affect existing leases, except that the farmer will be entitled to an equitable reduction of his jumma for any land so assigned in nankar. The lands should all be assigned before the commencement of the next khurreef.

3rd.—Those mouzahs where no proprietors are found to exist. These become the absolute right of the Jagheerdars. An *assameewar jummabundee* should be carefully drawn out, specifying the different classes of assamees, and fixing the rate, and total rent, payable by each, as well as the rights of subleasing, &c., possessed by each. Some little favor may be shown in fixing the rates of those who have evidently, some time or other, possessed proprietary rights, of which they have been dispossessed for a period, which precludes restitution to their full rights.

Kusbah Sohraneh is a peculiar case. It appears probable that in the Kusbah and some of the poorwahs, the Jagheerdars have so entirely dispossessed the Brahmin Chowdrees for a long series of years, that no proprietors can be said to exist in them. Some of the poorwahs still, however, remain, or have till lately remained, in the hands of members of the family of Chowdrees. These might either be settled with the proprietors, or nankar lands might be assigned in them. The latter will probably be preferable.

Existing arrangements, regarding Chowkeedars and Putwarees, should be maintained. In the setlled villages, the nomination to the office of Putwaree would rest with

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the zemindars: but in the nankar and ryutee villages, with the Jagheerdars, subject in both cases to confirmation by the Collector.

The hereditary pergunnah Canoogoes should be maintained in their rights. The Jagheerdars may be allowed to select them from the family, subject to confirmation by the Collector. Their nankar should be fixed either in money or in land, as may hitherto have been the case; and may be assigned from the share of each Jagheerdar, in proportions corresponding with the interest of the Jagheerdar. The allowance in money should be determined from each village, or the nankar in land marked off.

It will probably happen that these operations will affect the value of the several shares held by the Jagheerdars. That must not be allowed to disturb the existing partition amongst the Jagheerdars. Each sharer took his share for better or for worse, and no change can now be allowed.

Camp Chibramow,
The 20th Feb., 1846. J. THOMASON.

N. B.—The above are rough notes, drawn up after cursory investigation. They must be taken as general directions, and be held open to such modification as more minute enquiry may show to be clearly necessary.

J. THORNTON.
Secy. to Govt., N.-W. P.

No. 118A.

From F. H. Robinson, Esq., *Commissioner of the Agra Division, to* W. Muir, Esq., *Secretary, Sudder Board of Revenue, North-Western Provinces.*

Sir,—I beg, with reference to the orders of Government noted in the margin, to lay before the Board a report on the measures taken under those orders in Pergunnah Sukrawah. . . . .

No. 3709, dated 23rd August, 1844.
No. 3065, dated 19th July, 1845.
No. 2362, dated 3rd June, 1846.

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2. I have drawn up this report because the Collector had not time to compile it. I use the word *compile* advisedly, for my labor has been merely to digest and arrange the information collected by Kalee Raee, the Deputy Collector; and to the giving him, from time to time, a few suggestions as to the points to which his attention should or should not be directed.

3. I have gone somewhat into detail, with respect to the judicial decisions for two reasons. When right, they will serve as precedents, and from them principles may be extracted for the decision of similar cases elsewhere. When wrong, this report will afford the Board and Government the opportunity of preventing the farther progress of error.

4. I am of opinion that Kalee Raee deserves the favorable notice of Government for the intelligence and industry with which he has conducted the operations reported.

History of Pergunnah Sukrawah.

5. The early history of this pergunnah, from the paucity of written documents which marks this portion of Hindoostan, is only to be found in vague traditions. Of these, the oldest attributes the possession of this pergunnah to Rajah Poorun Singh, a Chowhan Rajpoot; and of him nothing is commemorated, except that he found the Philosopher's stone in a certain tank, and bestowed it on a wandering fakeer. The tank bears, to this day, the name of Sukra Poorun. A fort built by him exists in Sukrawah Khas; and the inhabitants of the village of Husmendhee, a hamlet of Dowlutabad, within the jahgeer, boast to this day that they are the descendants of Poorun Singh. Of the time that he flourished, I have no information; but it was probably under the Mogul Emperors, before the establishment in the province of the authority of the Bungish family.

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6. At the time* of their acquisition of the province, it appears from authentic records, that the pergunnah was held by six tribes; 1st, the Gour Thakoors, seated at Doondownee; they held Doondownee, Shurreefabad, Nuglah Khem Kurn, Rughoonathpoor, Dilawurpoor; 2nd, the Byse Thakoors, inhabiting Botum: they came originally from Ror in the neighbouring pergunnah of Sukutpoor, and held here Mudhee, Botum, Hosheepoor, and Bikkoopoor; 3rd, another family of Byse Thakoors, who came from Kundulee in Pergunnah Sukutpoor, and held Bicheree, Bheelumpoor, Kootubpoor, Shurreefpoor, Bhygaon, Russoolpoor, and Odelapoor; 4th, the Brahmin chowdrees, who held Sukrawah, Eshunpoor, and Omurpoor; 5th, the Thukurwar Thakoors, who held Dowlutabad, Muchoopoor, Bhubooteepoor, and Denapoor; 6th, the Aheers, who held Beerpoor. Besides, a Brahmin family, who were the Purohits, or family priests, of the Byse Thakoors, held from them the two villages of Moorra and Atoopoor.

* 1713 A.D.

7. After the province of Futtehgurh came into the possession of Mohomed Khan Ghuzuffur Jung Bungish, he, in 1774 A.D., allotted this pergunnah to his three sons, Munsoor Alie Khan, Munour Khan, and Khodabund Khan in jagheer; and in jagheer it has ever since been held.

8. In the year 1816 Sumbut, A. D. 1760, the Nawab Raees of Furruckabad, Ahmed Khan Ghalib Jung, son of Ghuzuffur Jung, attacked the village of Dowlutabad and slaughtered the *Thakurwar* Rajpoots, captured and forcibly converted Chuttur Singh and Kindhur Singh, the sons of Koondun Suhai, one of the chiefs, changing their names to Soofee Khan and Seetul Khan, respectively. He bestowed on Soofee Khan, Muchoopoor in jahgeer.

9. On the death of Khodabund Khan, mentioned above. his son, Khirudmund Khan, Ameen-ood-dowlah, (whose

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sister, Omrao Begum, married the Nawab Moozuffur Jung Diler Himmut Khan, Nawab Raees) succeeded to his possessions, and also to those of Munsoor Alie Khan, his uncle, who died without offspring. This Ameen-ood-dowlah became afterwards naib or minister of the State under Moozuffur Jung.

10. Under him the Byse Thakoors, zemindars of Bhygaon, resisted his authority, and to overcome that resistance, he made over these villages to Chowdree Muhanund and Chowdree Odeychund of Bishungurh, favorites of Almas Ali Khan, the eunuch Governor of the neighbouring districts under the Nawab Wazeer of Lucknow. Supported by the troops of Almas Ali Khan, Muhanund marched against the Bhygaon zemindars, and besieged them, in 1207 Hijree, or 1792 A. D., in their fort of Bicheree, under their chief, Mandhata. The siege lasted eleven days, and the place was then entered by Muhanund who took Mandhata prisoner.

11. On this occasion the Nawab Moozuffur Jung, at the instance of Ameen-ood-dowlah, issued a *sunnud* to Muhanund and Oodeychund to the following effect:—

"Muhanund Chowdree; may you be protected!

"Your representation, with Rs. 100, and 11 gold mohurs, " a *nuzzur* of congratulation on the victory of the Fort of " Bicheree, informing us that Mandhata, who labored un- " der our displeasure, has been taken with loss of life of " the men in the regiments of our Government, and that " great expense has been incurred for the troops of Almas " Ali Khan, and for presents to him, has reached me, " through our beloved brother, Khirudmund Khan, Buha- " door, and has been well considered.

" Whereas, from being informed of the tyranny, outrage, " and plunder committed by the offender, our displeasure

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" was aroused, and we were desirous that he should be " utterly despoiled, and you have despoiled him; we are " highly pleased with your zealous exertions: for the said " district has thus become cleansed from the dirt and " filth of the rebel. On account of these zealous exer- " tions, we confer on you the zemindaree of Bicheree, &c., " 14 villages, the zemindars of which have always been " notorious for turbulence and rebellion.

" It is incumbent on you that, considering yourself in " all confidence the zemindar thereof, you allow none of " the rebels to settle therein, and that you be diligent in " protecting the town of Sukrawah, and that you consider " us intent upon your welfare. What more shall be written? " Given the 22nd Shuhur Jumadoossanee, 1207 Hijree, " [1792 A. D.]"

12. Under this grant, the Chowdrees held till 1236 Fuslee, or 1821 A. D.; but the old zemindars remained on the estates, and suffered much oppression from Chowdree Mahanund. One instance has been chronicled in a local ballad. He turned the Gour Thakoors out of Doondownee, and, himself a brahmin, forcibly possessed himself of, and made one of the girls of the family his concubine.

13. Further the Jagheerdars called in a tribe of Aheers from the village of Beerpore, and settled them to the exclusion of the old zemindars in Doondownee and Dhoba, where they built forts, and acquired much power, and overawed the whole pergunnah.

14. This state of things continued till the cession of the province to the British in 1803 A. D., when, in reward for the good offices of Ameen-ood-dowlah, in bringing about the cession, the British Government granted to him the pergunnah of Sukrawah, under the following *sunnud*:—

" Seal of the Government, marked by excellence, of the " illustrious English Company; the depository of the

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" weighty matters of the kingdoms confided to them in the
" land of Hind.

" Be it known to Judges and Collectors now and to " come, to the scribes charged with the offices of Govern-" ment, to the Jagheerdars, Kurarees, Chowdrees, and Ca-" noongoes of the pergunnah of Sukrawah, &c., attached " to the district of Furruckabad :—

" At this time the villages of Sukrawah, &c., hereunder " written, situated in the pergunnah of that name, have " been granted by the Nawab of illustrious dignity, the " honored among nobles, Lord Minto, Governor Bahadoor " —(May his prosperity endure for ever!)—under orders " dated 30th May, 1811, as a perpetual grant, generation " by generation, descent by descent, from parent to son.

" To Ameen-ood-dowlah Muzzuffurool Moolk, Nawab " Khirudmund Khan Bahadoor, Baburgunj.

" You are bound to consider those villages as freely held " and exempted from the *pen*, and to leave them in the " possession of the said Nawab; that, from generation to " generation, he may take the revenues thereof to himself."

(Here follows the list of the villages.)

" Written on the 24th December, 1811."

15. From 1789 A. D., the time the Nawab Ameen-ood-dowlah held the pergunnah under the Nawab Raees, and afterwards under this grant, he sedulously applied himself to abate the rights of the landholders. For this purpose, he built a fort at Sukrawah and resided there, and allowed the brahmin zemindars, called (from their hereditary office) Chowdrees, to hold only the lands they actually cultivated. He also tried himself to destroy the power of his former creatures, the Aheers of Beerpoor, settled at

Dhoba. Under demands for revenue, he, by the agency of the courts, caused the houses and orchards of them, and the Thakoors of Doondownee, to be sold, and himself bought them.

16. He expelled the Aheers from Dhoba, and pulled down the houses of the Thakoors of Doondownee. He razed the fort of the Aheers at Beerpoor.

17. He drove out the Zemindars of Suddurpoor and Beebeepoor; but in all these cases assigned small portions of land as *nankar* to them for their subsistence. These allowances are entered in the pergunnah accounts up to 1206 Fuslee [1799 A. D.]

18. Ameen-ood-dowlah died in 1233 Fuslee, or 1826 A. D.

19. Disputes arose among his children, with regard to the partition of their heritage. The jagheer was, therefore, attached, pending judgment by the Civil Courts.

20. The revenue authorities, under this attachment, took charge of the estates during 1235 and 1236 Fuslee [1828 and 1829 A. D.], and in most instances restored the old owners and collected rents from them. It was at this period that the Bishungurh Chowdrees' family lost their possession of the 14 villages of Bhygaon.

21. The Court, under decrees duly passed, divided the estates into five portions, and assigned them to the five sons of Ameen-ood-dowlah, and raised in 1237 F. S. [1830 A. D.] the attachment.

22. On the release of the attachment, the Jagheerdars were opposed in their attempts to regain possession of the fort of Dhoba by the Aheers, who, under the attachment, had re-established themselves there.

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23. These men refused obedience to the civil power, till a force was marched against them from Futtehgurh, at the instance of the Magistrate, when they gave in.

24. The disputes between the sons of Ameen-ood-dowlah were settled, as above stated, by the Civil Court, but subsequently the daughters sued their brothers for their share of the inheritance, and the pergunnah was again attached and managed by the Collector *pendente lite,* from 1240 F. S. [1833 A. D.] to 1245 F. S. [1838 A. D.]. The Courts then having decided the suit, took off the attachment; and no event worthy of notice has occurred in the jagheer till the commencement of the present enquiry.

25. *Topography.*—The pergunnah of Sukrawah is situated south-east in the district of Furruckabad, and is in a ring-fence, with the exception of the detached village of Dhoba.

26. By survey, it contains 26,508 acres; 17,375 acres of which were cultivated; 100 acres culturable, and 7,134 acres unproductive. In Dhoba, 1,899 acres, of which there is no account.

27. *Value.*—Its annual yield is of the value of Rs. 38,000.

28. *Population.*—The accompanying map shows by what classes the different mouzahs are held.

29. The male population of the whole pergunnah, by a census taken before the famine, consisted of 8,189 souls. In eight villages (taken at random) the present male population is 1,218. Before the famine it was 1,718. This proportion, applied to the whole population, gives 6,400 males, in place of 8,189, and is a striking proof of the effects of the famine. Both the general census before the famine and the present were carefully taken.

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30. The houses before the famine in these eight villages were 555; they are now 397. In the whole pergunnah there were 2,470 houses. By the same calculation there ought now to be 1,764. The houses are in both cases not enclosures, but the separate habitations of separate families, of which there are sometimes more than one in one enclosure. In fact, by "house" is to be understood *ghur,* not *ehatah.* This gives a proportion of 302 males to each house or *ghur.*

31. I now proceed to detail the judicial decisions.

No. I.

Case of Mouzah Aloopoor, otherwise Hassunpoor.

The zemindaree is claimed by a brahmin family, and their claim is denied by the Jagheerdar.

32. The proofs are: the entry of the names of the ancestors of the claimants in the old records; continual possession down to the present time; oral evidence; and the admission by the claimants of a stranger to an eighth share, on his advancing money to them, in consideration of being so admitted.

33. The Collector decides that the estate belongs to the 2nd class, and I think the tenure belongs to the 1st class, and rule accordingly.

No. II.

Case of Mouzah Beebeepoor.

34. In this case a family of brahmins claim the estate, and their claim is disputed by the Jagheerdar, principally on the ground of an agreement, signed by two of them in 1827, in which the Jagheerdars deny that the brahmins have any right in the village.

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35. Their claim rests upon the following proofs. Possession as tenant farmers by one of them, from 1234 F. S. or 1827 A. D., till now:—the grant by them of rent-free ground to brahmins, who have since sold that ground, wells, houses, and orchards.

36. The objections to their claim are, that neither their names nor those of their ancestors are found in the ancient records, and that whatever member of the family has held the lease since 1827 A. D. took all profits to himself, and made over none to the brotherhood.

37. To my mind, the proof of proprietary right is quite defective; and I reverse the Collector's decision, which assigns to them do biswaee land, and places the estate in the 2nd class; and I direct the estate to be placed in the 3rd class.

No. III.

Case of Mouzah Deenarpoor.

38. This is the Deenarpoor mentioned in the reports on Bhubooteepoor and Muchooapoor. The zemindaree belongs clearly, by the old accounts, to a brahmin family, of which, in 1205 F. S., Purmesree Doss was the head.

39. The oldest account is of 1178 F. S., when the muhal of Muchooapoor (including Bhubooteepoor and Deenarpoor) was held by Purmesree Doss, Kesho Rai, ancestors of the Muchooapoor family, and Hurdeyram, ancestor of the Bhubooteepoor family.

40. In 1205 the Muhal Muchooapoor was broken up into—

BHUBOOTEEPOOR,	MUCHOOAPOOR,	DEENARPOOR,
Gopal Singh,	*Muheeput Singh,*	*Purmesree Doss.*

41. To these people malikana was credited in the Government accounts for 1205 and 1206, as specified in the

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report on Bhubooteepoor, and thereby the zemindaree right of the parties is irrefragably established to the respective villages. From the accounts, it appears that Purmesree Doss continued in occupation till the year 1219; from that time till 1235 no account of the malgoozaree is traceable; but in 1235 the theekadars were Moolchund, and Buhadur Singh, the heads of the Muchooapoor family. In 1236, Goomanee Lall, a stranger, was farmer-tenant till 1239. Then the estate was placed under attachment and so continued till 1242, when Moolchund, grandson of Purmesree Doss, was admitted as theekadar, and is now in possession.

42. Buhadoor Singh, the head of the Muchooapoor family, claims on the ground that Deenarpoor was a muzreh (or offset) of Muchooapoor, and that the whole three estates belong to the Thukurwar community. He files an agreement to pay malikana, dated 1214 Fuslee, purporting to be from Purmesree Doss to Purshad Singh, one of the Thakurwar family; but the claim is upset by the appearance of Purmesree Doss's name in the early record of 1178 Fuslee, and the subsequent partition in 1205, and the utter absence of evidence in support of the document of malikana to Purshad Singh. I have rejected Buhadur Singh's appeal to me.

43. There remains the judgment of the Collector. He ranges the tenure in the 2nd class, because Moolchund, the claimant, in his deposition declares that he derived the zemindaree from the grant of Khirudmund Khan, the Jagheerdar, and because this statement is unsupported by evidence, and because it is not clear how Purmesree Doss obtained possession. The Collector admits that Purmesree Doss and Moolchund have long been *de facto* zemindars, but as the collaterals of the family have no share in the profits and management, he finally decides that the

tenure comes not in the first class, but the second, and assigns to Moolchund the right of do-biswaee.

44. My opinion is different. We find by the old documents and accounts, of which no one denies the authority, that Purmesree Doss was in possession generally with the Bhubooteepoor and Muchooapoor families, in 1178. We find him admitted to the separate right in Deenarpoor in 1205 and 1206, and drawing malikana from the existing Government in 1205 and 1206 Fuslee, to the amount of 24 rupees annually; we find him and his descendants in malgoozaree occupancy down to the present day; we find Moolchund's claim unopposed by the Jagheerdar, and leases granted by the Jagheerdar, in which Purmesree Doss and Moolchund are styled zemindars; we find alienations of land which the grantees say they obtained from Purmesree Doss. I conclude that the tenure falls into the first class. I am of opinion that the Collector should be instructed so to treat it, and to draw out a statement of liabilities, on which occasion the claims of collaterals, if there are any, can be adjudged under the rules prescribed. Orders to this effect have been issued by me.

No. IV.

Case of the village called Neglah Eeshumpoor.

The claim of Muhanund and Chudamee Lall, brahmins.

45. They claim (as a branch of the Chowdree family of Sukrawah, q. v.) the entire zemindaree of this nuglah, as their ancestral property.

46. There is no opposition on the part of the Jagheerdar. From the history of Sukrawah (q. v.) it will appear that this village is a portion of Sukrawah-east. The estate has been separated from the rest of Sukrawah-east, by the

testimony of a putwarree 80 years of age, for 60 years within his knowledge; how long antecedently he cannot say.

47. The earliest document adduced from the canoongoe's office is dated 1205 Fuslee.

48. A wasil bakee 1205 Fuslee "Hunsrai Chowdree "owes Rs. 209-3½ on account of mouzah Sukrawah, turuf "Powain, of which for nuglah Eeshumpoor Rs. 162-10½."

49. Hunsram was the grandson, and the claimants are the great-grandsons of Rikah Chowdree. A wasil bakee of 1206 or 1213 Fuslee "Khurk Sein Chowdree owes on Eeshumpoor Rs. 162-5." Khurk Sein was son of Rikah.

50. In an old document of 1205 Fuslee, it is stated that Khurk Sein Hunsram, and Chubah or Chubnath, are the malgoozars of Eeshumpoor. Chubnath was the father of Rikah; by this document they each paid a third of the whole revenue.

51. At the death of Khirudmund Khan, the Jagheerdar, the muhal was attached and included in the qusbeh.

52. In 1240, at the second attachment, the village was settled with Cheda, son of Chudamee Lall, the claimant. From the evidence of the petitioner and the claimants, it appears that for 40 years, whichever of the family got the malgoozaree took the whole profits, and did not account to the other sharers. The putwarree states that for many years the malgoozaree remained in the hands of Cheda Lall, father of Chudamee Lall, the claimant, and afterwards in the hands of Omed Rae, father of Muhanund, the claimant. Muhanund is now the malgoozar, but Chudamee Lall holds seer, rated at 30 rupees which, however, he does not pay. Witnesses depose that the claimants are zemindars. People holding rent-free land declare that land to have been granted by the claimants.

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53. The Deputy Collector pronounces them to be zemindars, and places the tenure in the 2nd class. The Collector affirms the decision, and orders the do-biswa land to be marked out. I annul the decision, and place the estate in the 1st class. The case is similar to that of Deenarpoor.

No. V.

Case of Muhal Moora.

Chubnath and Byjnath, brahmins, claim the zemindaree.

The following evidence is adduced by them in support of their claim:—

54. The seeahs of 1134 Fuslee, 1727 A. D., to the number of 11, which purport that the revenue of the muhal was paid by Nutha and Sooruth and Choonee. In these accounts they are styled zemindars; and the persons abovenamed are ancestors of the claimants.

55. A kubooleut, executed by Sooruth and Nutha for 1188 Fuslee, in 1781 A. D.

56. These documents are in the ancient records of the canoongoe's office.

57. In 1235 Fuslee, on the decease of Ameen-ood-dowlah, the Jagheerdar, when the jagheer was attached, the Collector settled the village with Gokulchund and Radharaee zemindars; and these persons are the descendants of Sooruth and Nutha, and collaterals of the claimants.

58. In 1236, the same engagement was continued by the Collector with the same persons as zemindars. When the jagheer was again attached in 1240 Fuslee this estate was leased by the Collector to the same Gokul and Radha from 1241 to 1243 Fuslee. In 1834 or 1241, Radha died, and his heirs were admitted to succeed as zemindars.

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59. In 1244 Fuslee and till 1246, Buldeo But, a stranger, was admitted to engage as malgoozar, but not as zemindar.

60. The claimants put in a putta under the seal of Ameen-ood-dowlah, the Jagheerdar, dated 1237 Hijree or 1229 Fuslee, from 1230 to 1232 Fuslee to Radha and Gokul; a puttah under a seal nearly illegible, but which seems to be from the Jagheerdar from 1237 to 1250 Fuslee to the claimants; and a puttah from Bund Allee Khan, agent of the Jagheerdar, from 1251 Fuslee to 1254 to the present claimants.

61. The canoongoes put in a statement to the effect, that the zemindaree of the village belongs to the claimants and Mohun-brahmin; but Mohun brahmin being examined deposes that he has no claim, and that the claimants are the zemindars, and that he has a bagh in the village planted by permission of the claimants. An inquest held by Dirgpal Singh, tehseeldar of Talgram, in April 1828 A. D., returns Gokul and Radhey as zemindars, on documentary and oral evidence furnished to him.

62. The oral evidence of neighbouring zemindars and of residents of the village substantiates the claim; so does the evidence of 10 persons holding grants of lands rent-free from the claimants and their ancestors.

63. It is clear, from careful local enquiry, that the village is divided into two thokes, one held by Chubnath, and the other by Byjnath, with 381 beegahs held in common. They hold wells and baghs, and exercise the rights of property in the village.

64. The Jagheerdar opposes the claim, and urges that Sporuth and Nutha Ajajee brahmins, and Choonee, the old zemindar noticed in the anicent records, are not the ances-

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tors of the claimants, and that the family are extinct. He also declares that the partition of the lands does not exist, but a fresh and careful enquiry by the tehseeldar established both facts.

65. The Collector decided that the tenure belonged to the 1st class, and I have confirmed his decision, in opposition to the Jagheerdar, who appealed to me.

No. VI.

Case of the village called Nuglah Oomurpore.

66. This village is part of Sukrawah-west (q. v.), but it has long been separated, at least from 1206 F. S., and probably long before.

67. Doolee Rai Chowdree claims the whole estate as his separate ancestral property.

68. The Jagheerdar denies the right, and says Doolee Rai is only a farmer-tenant. He allows he holds ancestral orchards and wells, but says he owns nothing as zemindar.

69. The oldest document is from the canoongoe's office, being a wasil bakee of 1206 F. S. as follows:—

"Nuglah Oomurpoor and others, 851 rupees jumma; malgoozar Upurbul Chowdree, (father of the claimant) owes, on account of Oomurpoor, Rs. 525; Ujaibpoor, Rs. 251; kasht in qusbeh-west Rs. 75."

Documents put in by the Claimant.

Dakhila to Doolee Rae	without date.
Farigh Khuttee to Apee, *i. e.*, Upurbul, zemindar, ...	1215 Hijree. / 1207 Fuslee.
Dakhila to the same zemindar, 1215 Hijree	1207 Fuslee.

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Dakhila to Upurbul, zemindar, 1216 Hijree	1208 Fuslee.
Dakhila to Doolee Rai, malgoozar, the claimant, ...	1240 Fuslee.
Dakhila to Doolee Rai, malgoozar, ...	1833 A. D.

70. The Jagheerdar put in no evidence whatever.

71. The Deputy Collector states, that at the two attachments, 1235 and 1241, the estate was leased to Upurbul and his son Doolee Rai, respectively; that from the measurement papers, there were 74 beegahs (pucca) held as seer in the village by the claimant and his relations; that the claimant, and his predecessor, Upurbul, as far as can be traced, have held separate possession, not sharing with the other members of the Chowdree family; that some of the fields are khet-bhut to this day, with other divisions of Sukrawah; and hence Kalee Rai infers a partition which formerly assigned this village to the claimant's branch of the Chowdree family of Sukrawah.

72. He declares the claimant to be the zemindar, and places the tenure in the 2nd class.

73. The Collector affirms the decision, and orders the "do-biswa" land to be marked off.

74. I modify this decision, and place the estate in the first class. The full right is fully made out.

No. VII.

Case of the village of Sudderpoor.

Claim of Punchum Singh and Luchmun Singh, brahmins.

75. These persons claim the whole proprietary right of the village as their ancestral property for a space of 400 years, more or less; and indicate, as proofs of their right and possession, a dwelling house, a dilapidated well, two

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orchards planted by their ancestors, two other wells, one orchard planted by themselves, possession of two talaubs or ponds, possession of the wild trees in the village, the management of the cultivation, the power of locating cultivators, the alienation by their ancestors of 15 beegahs of land composing a religious endowment, together with other grants and alienations made by themselves; the holding seer land. They invoke the oral testimony of several neighbouring inhabitants, and the official testimony of the canoongoe of the pergunnah, to the truth of their claim.

76. The Jagheerdar denied the claim, and pleaded that the new wells and orchard were not constructed or planted by the claimants, but by him.

77. Also, that the power exercised by the claimants was the result of their renting the estate from him, and their acts the acts of a tenant, not of a proprietor; that in the written counterpart lease or kuboolent, drawn up for the farm, there is a statement by the claimants that they have no proprietary right, and that the Jagheerdar is the sole proprietor; that if the claimants had been zemindars, they would asssuredly have received compensation in the shape of malikana; but that this they (the claimants) could not show to have been the case.

78. Punchum, one of the claimants, being shewn the lease, denied its authenticity, and observed that it ran in the name of himself and Kindhur, and that he never had a partner of that name, nor was there any one of that name in the village.

79. The Peshkar who measured the village, in his report, recorded the claimants to be the zemindars, and to be in possession under a lease.

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80. The persons in possession of grants and endowments in the village declared that they held them under grants from the claimants or their ancestors. The hereditary ryuts deposed that the claimants were the proprietors.

81. Respectable neighbours deposed to the same effect.

82. The canoongoes certified officially to the same effect.

83. On the investigation made by tehseeldar Dirgpal Singh in 1828, he declared Kesree Singh and Seetaram, uncles of the claimants, to be the proprietors.

84. Bhowanee Aheer, partner in the lease now held by the claimants from the Jagheerdar, declared he was only a partner in the speculation, not in the proprietary right. The Deputy Collector, Kalee Rai, having in his possession the authentic ancient accounts of the village, proves that it was occupied by a family of Aheers from 1134 F. S., before the cession to the British down to 1213 F. S., under the British rule, and as he cannot find any conveyance to the present claimants from the Aheers, who were forcibly dispossessed by the Jagheerdars, he concludes that the claimants could only have been admitted by the Jagheerdars as farmers, and that all these acts were those resulting from their position as farmers. The Collector agreed with Kalee Rai.

85. The claimants petitioned me in appeal; the only new point they made was that the Aheers had mere talookdaree possession during the whole period, and that the claimants were, during the Aheer possession, still zemindars; but they proffer no proof.

86. I dismiss the petition, because I think the evidence of the ancient accounts incontrovertible, and because the claimants in their appeal put forward a statement, that in fairness and candour they ought (knowing and acknowledging the facts as they do) to have inserted in their

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original petition of claim, instead of making a positive assertion of 400 years' possession. That so much direct evidence is given on their side is accounted for by the fact that the claimants are Brahmins, and the witnesses Hindoos.

No. VIII.

Case of Qusbeh Sukrawah.

87. Before entering into the claims, a short sketch of the history of the qusbeh is here given so far as is known. The official and traditional report of the canoongoes declares that the zemindaree originally belonged to a tribe of Aheers. One of the Jagheerdars asserts that they were driven out 400 years ago. Between the alleged expulsion of the Aheers, and the year 1134 Fuslee, no account of the disposition of the proprietary right is to be found; but for that year a seeah tareekhwar, or account of daily receipts of revenue, exists in 40 entries, from which it appears that on two occasions, Hirdey Ram, one of the family of the Chowdrees of Sukrawah, paid revenue. From that time to this, by the Government records, the partial, and at times interrupted, possession of this family of Chowdrees is to be traced down to the present day. Qusbeh Sukrawah appears, from a time anterior to the earliest documentary evidence, to have been divided into two parts :—

88. Sukrawah-east, 8 biswahs; and Sukrawah-west 12 biswahs. Sukrawah-east (Powaen) comprised a portion of the area of the qusbeh and nuglah Eeshumpoor.

89. Sukrawah-west (Puchan), the other part of the qusbeh nuglah Bullahur, nuglah Nanha, nuglah Kuspoorah, nuglah Dabeepoor, nuglah Ujaibpoor, nuglah Oomurpoor, and Mirzapoor an offset of nuglah Oomurpoor, now (*vide* No. XXVII.) in the possession of Kamraj Aheer, and

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probably a remnant which remained by some accident in the hands of the ancient Aheer zemindars of qusbeh Sukrawah.

90. Eeshumpoor, Oomurpoor, and Mirzapoor have long been separated estates or muhals, but the portions above enumerated at present compose the estate or muhal of Sukrawah.

91. It is to these alone that the following account applies.

92. There is a gap in the records from 1134 to 1205 Fuslee. In 1205 Fuslee it appears from the wasilbakee accounts, that the malgoozaree, or right to collect and pay the revenue in qusbeh Sukrawah, was not in the hands of the present claimants—that is, the brahmin Chowdrees of Sukrawah; but there is a separate jummabundee of the seer lands held by them in the qusbeh, which is proof in full of the acknowledgment of their proprietary right. But their possession of the malgoozaree of Dabeepoor, Ujaibpoor, and Bullahur, appears clear from the same documents. These last-named nuglahs had at the time separate jummas, or sums of land revenue, assessed on them.

93. There is another gap in the documents from 1206 to 1227 Fuslee, according to the Deputy Collector. He states that the *theeka* or lease of the whole qusbeh (kul qusbeh) was given to the claimants, under the Jagheerdars till 1230 Fuslee, but I cannot find the grounds for this statement in the proceedings. After the death of Khirudmund Khan, the jagheer was attached in 1235 Fuslee; and the lease of western Sukrawah was given to Sookhlall and other Chowdrees with two Kaets; and that of eastern Sukrawah to Subsookh Rae and other Chowdrees, as zemindars for 1235 Fuslee. From 1242 till 1244 Fuslee, the lease of the whole muhal is stated to have been given to

Tiluk Chund, Chowdree; and from 1245 to 1246 to a stranger. All the intervening years the estate appears to have been kham.

94. The following facts have been collected by Kalee Rae. The family hold seer as follows :—

SUKRAWAH-WEST.

Seer Land.

	Bgs.	Bs.	
Qusbeh Khas	5	0	Omur Singh.
Bagh belonging to Ram Bux,	66	10	Bhowannee Pershad.
	16	4	Doorga Pershad: in the occupancy of Duleep and Runnooa Kachees, his ryuts.
Nuglah Bullah, ...	0	0	There is no possession of the family of any sort.
Nuglah Minah, ...	0	0	Ditto.
Nuglah Kaspoor,...	0	0	Ditto.
Nuglah Debeepoor,... ... / Nuglah Ujaibpoor,... ...	0	0	In Debeepoora, Purmesree and others;

and in Ujaibpoor, Girdharee and others are settled, and have complete possession; even to the wild *babool* trees, which they sell, and hold even now the lease of the Nuglahs from the Jagheerdars; and they, the residents alone, and not those of the tribe who live elsewhere.

95. Nankar, by the old accounts, is assigned to the Chowdree (according to Kalee Rae in the accounts of 1205 Fuslee.). This I cannot trace in the *misl*, but I find in the accounts of 1212, Rs. 75 allowed on this account.

SUKRAWAH-EAST.

96. The qusbeh contains 728 cultivated beegahs, of which there is seer held by the Chowdrees as follows :—

Seer land.

Bgs.	Bs.	
60	6	Omed Rae.
35	0	Lalljee and Chudamee.
5	0	Khurksein in the possession of one Makhun.
8	0	Sookh Lall.
8	0	Heera Lall.

Two baghs are in possession of Omed Rae.

97. The rest of Sukrawah-east is composed of Eeshumpore, separately treated of.

98. The zemindaree of all the mehal was claimed by the Chowdrees. Their right was denied by the Jagheerdar absolutely; and on being specially questioned, as to the nankar entered in the old accounts, he urged that this was an official allowance on account of the office of Chowdree before the British Government: but this is upset, because Kalee Rae states the account of 1205 Fuslee to contain an entry of 80 Rs., of which 50 Rs. goes to Sukrawah-east and 30 Rs. to Sukrawah-west—thus connecting the allowance with the zemindaree, not with the office.

99. He was able to offer no evidence against the rest of the documentary evidence, the actual possession, and oral testimony. The Collector placed Ujaibpoor and Debeepoor in the 2nd class, and in qusbeh Khass, he secured the present holders in their seer land at favored rates, and in nothing more. This decision I confirm.

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No. IX.

Case of Mouzah Bhekhoopoor.

Gundhurup Singh and Oomrao Singh, Byse Thakoors, both claim to be zemindars.

100. The Jagheerdar denies their claim, but in his denial makes a very important admission—*viz.*, that Gundhurup and Oomrao Singh being joint theekadars, and that Oomrao falling into balance, he (the Jagheerdar) made over Oomrao Singh's half of the village to Gundhurup Singh. Now this seems conclusive as to the point that the village was held in bhyachara tenure,—that is, that one co-sharer had possession of one part of the lands; the other of the other—an arrangement which I never knew to exist except among proprietors.

101. Again, while this estate was in farm to Oodey Chund, Chowdree of Bishungurh, we find that in 1806 there were also two tenants under him—Deenanath, ancestor of Gundhurup, and Oomrao Singh, the other claimant; and that the same thing occurred then, *viz.*, Tej Singh, ancestor of Oomrao Singh, fell in balance, and Oodey Chund made over his share to Deenanath, taking the balance from him, and providing that when Tej Singh paid the balance so advanced by Deenanath, he should be readmitted.

102. There is but one notice of this estate in the old records, *viz.*, that in 1188 it was leased to Bullum Singh, zemindar of Shurreefpoor, and Himmut Singh, zemindar of Botum. Bullum Singh is the grandfather of Oomrao Singh. Himmut Singh was a first cousin of Gundhurup Singh. The transactions above described leave no doubt that the interest of the claimants in the village is of a proprietary and hereditary nature, and both the Deputy

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Collector and Collector agree in placing the village in the second class; but as Oomrao Singh has no possession, they exclude him from all benefit.

103. In this I think them wrong, and I have directed them to place the estate in the first class, and to try Oomrao Singh's claim under the settlement rules. If we look to either the arrangement of Oodey Chund, or that of the Jagheerdar, he must be held to have the legal possession, though his occupancy is suspended by the forced impignoration of his rights to Gundhurup Singh, in payment of the balances. The Collector has been ordered to try the following issues:—The rights of Oomrao Singh, to a share of the muhal, and, if that is admitted, under what circumstances he is to be held entitled to redeem the forced mortgage to Gundhurup Singh.

No. X.

Case of Mouzah Beelumpoor.

Rampershad, as one of the heads of a community of Byse Thakoors, claims the proprietary right as immemorial and ancestral property.

104. The following proofs are adduced.

I. This village is situated in that portion of this pergunnah, and of pergunnah Suckutpoor, which is situated on the east side of the nullah Arind, called, from the zemindars east, the *Bysewarah.*

II. In the ancient records, in the wasilbakee of 1129 Fuslee [1722 A. D.], the name of Hurree Singh is entered as malgoozar. In the wasilbakee of 1178 Fuslee [1778 A. D.], the names of Urjun, Ram Singh, and Bhowanee Singh are entered as malgoozars. In the wasilbakee of 1184 Fuslee [1777 A. D.], the names of Bhowanee Singh and Urjun Singh

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are entered as malgoozars. Ram Singh and Bhowanee Singh are ancestors of the present claimants.

III. In 1235 and 1236, the estate was attached on the death of Ameen-ood-dowlah, the Jagheerdar; and in 1241 to 1246 the estate was again attached; and during both these attachments settlement was made with the Thakooraen of Bishungurh as zemindar; but she, on this occasion, makes no claim.

By an inquest made by Dirgpal Singh, Tehseeldar of Talgram in 1828, on the first attachment, it appeared, that the zemindaree of old belonged to the Byse Thakoors, but that for 45 years the Thakooraen had been in possession, she under-letting the estates to the Byse Thakoors. They held baghs and houses, but from fear of the Thakooraen, did not urge their claim. It appeared that in 1260 Hijree [1792 A. D.], Muhanund Chowdree, ancestor of the Thakooraen, sent a nuzzur of 101 rupees and 11 *ushurfees* or gold-mohurs, to Nuwab Muzuffer Jung, Raees of Furruckabad; and stated that he had taken with great loss the fort of Bicheree, and made Mandhata, the Byse Thakoor chief prisoner, and had been put to great charges. In return, Muzuffur Jung issued a perwannah dated 1260 Hijree 1792, conferring on Muhanund the zemindaree of 14 villages of Byse Thakoors; this included Belumpoor. There was adduced also a perwannah from Ameen-ood-dowlah, the Jagheerdar, dated 1240 Fuslee [1825 A. D.], replying to an address of the Thakooraen, praying that in consideration of the loss of men and money sustained in the fight against Mandhata, the Byse chief, no increase of jumma might be taken from her; to the effect that these losses had been compensated by the grant and possession of the zemindaree of these villages. From this it is clear that the Thakooraen obtained the villages from the then ruler of the country, Muzuffur Jung; and she continued to hold them till 1839 A. D. [1246 Fuslee], since when she has brought forward no claim.

IV. In spite of the grant of the zemindaree (as above) to the Chowdree faimly, repeated sub-leases were granted by the Chowdrees to the Byse Thakoors; and thus they kept possesssion of their rights.

V. The canoongoes bear official testimony to the right of the Byse Thakoors and their possession.

VI. Nuglah Simra is a nuglah or hamlet of this village, inhabited by Lodhas. They declare that they were settled in the village three descents ago by Gunga Singh, grandfather of Rampershad, the present claimant.

VII. There is a large babool jungle in the village in the possession of the Thakoors. The agent of the Jagheerdar deposes that the Jagheerdar has a claim against them for Rs. 1,000, and that he has repeatedly urged the Thakoors to cut the timber in satisfaction of the claim, and that they have only now consented to do so.

VIII. A large portion of the land is divided among the Thakoors, *i. e.*, two-thirds of the cultivation

IX. The village has been sub-let to Rampershad and Roshun Singh alone; yet the Putwarree and the Jagheerdar's agent depose, that all the Putteedars share the profit and loss; one puttee alone, by decision of a punchayet, does not share, but holds 12 beegahs cutcha rent-free as a compensation.

105. The Jagheerdar simply denies their claim. There is an immense body of oral evidence in favor of the claimants. The Collector places the tenure in the 1st class; and I confirm the decision on the ground that the grant to the Chowdree family has not been carried out, as is proved by the indubitable actual possession of the Thakoors. If the Chowdree family wish to sue out the grant from Muzuffur Jung, they must proceed in the Civil Court.

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No. XI.

Case of Mouzah Bijehree,

CLAIM of Duryao Singh and Tej Singh, Byse Thakoors.

106. The following points are admitted by the claimants and the Jagheerdar.

107 About the year 1850 Sumbut, Chowdhree Muhanund, under the orders of Ulmas Ullee Khan, the Nazam, assembled a force; attacked, defeated, and took, with considerable slaughter, the fort of the ancestors of the claimants who were the zemindars of this village. The Nawab Raees Muzuffur Jung thereafter granted, by a document filed, the zemindaree of this estate to Chowdhree Muhanund. The claimants were dispossessed till seven years ago, when Laek Singh, one of the family of the claimants, obtained a lease of the estate from the Jagheerdar. He is dead, and the lease has been voided. The possession of the claimants extends to the holding by Tej Singh of 52 beegahs of seer land; by Duryao Singh of 50 beegahs of seer and 6 beegahs rent-free land, and the possession of two orchards pledged to the Jagheerdar.

108. The points contested are, 1*st*, whether the taking of the village and the grant of the zemindaree to Chowdhree Muhanund extinguish the title of the claimants; 2*nd*, whether the lease to Laek Singh was a lease to him as acknowledged village zemindar, or a lease as to a farmer-tenant; 3*rd*, whether the holding of seer and maâfee land and the two orchards is a holding in zemindaree right, as a portion of the zemindaree still in the hands of the claimants; or a holding in private property personally, or by sufferance of the Jagheerdar.

109. All these points have been decided in favor of the Jagheerdar by the Collector.

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110. My opinion is that, by the transactions of 1850 Sumbut, the zemindaree right was confiscated by the act of a competent authority—that is, of the reigning power; and that thereby the title of the claimants to the zemindaree has been utterly and totally extinguished, and that the confiscation has been fully carried out.

111. The claimants, in an appeal to me, state that one of their body holds a conveyance, from the heirs of Muhanund Chowdhree to one of their family of the zemindaree right; but the document is not produced, and the claim has no connection with the present enquiry. If it be acted on, the holder of the conveyance must come on in the shoes of the Chowdhree Muhanund, and give an opportunity to the Jagheerdar to state what objections he can urge to that claim.

No. XII.

Case of Mouzah Bhygowan.

There are here two conflicting claims independently of the Jagheer right.

One from Mungul Lall and others, belonging to the Chowdhree family of Sukrawah,

And another on the part of a Byse family of Rajpoots.

112. I will first deal with the Chowdhree's claim.

113. They adduce the following evidence.

114. A lease they now hold from Jograj, mortgagee of the village, for five years ending in 1256.

115. The oral evidence adduced by them turned entirely against them, and went in favor of the Thakoors.

116. The ancient canoongoe, a man of years, declares the tradition to be that the zemindaree belonged of old to

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the Chowdhree's family; but that, almost 100 years ago, these Byse Thakoors attacked, slaughtered, and drove them out, and have ever since been in possession.

117. They have the lease, as above specified, from the mortgagee, and possession as tenant-farmers. This claim has been rejected.

118. We now come to the Thakoors.

119. They appear in the ancient records and accounts kept by the canoongoes as in possession in 1183 Fuslee as zemindars, again in 1188, 1184. It appears from the same evidence that in 1188 there were two turufs in the village, one of Bullum Singh and one of Upurbul Singh.

120. The inquest made by Dirgpal Singh (the tehseeldar) in 1235, shows that the Thakooraen of Bishungurh was in possession of the malgoozaree as tenant-farmer; but that these people were the reputed zemindars, and claim the zemindaree. The official report of the canoongoes declares them to be the zemindars.

121. The claimants file a receipt dated 1176 Fuslee (which is in great part illegible) to Bubar Singh, turufdar, who is one of their ancestors; a perwannah from the Jagheerdar dated 1230 Hijree, to the claimants, as zemindars of Bhygowan—telling them that the assamees of Bhygowan had gone to the village of Shurreefpoor (which also belongs to the claimants) and requiring them to send them back. It is remarkable that they are designated as zemindars of Bhygowan, although it is stated in the body of the perwannah that the ryuts have fled to Shurreefpore "*elaquahee eshan.*"

122. A dakhila for 200 rupees dated 1187 Fuslee for turuf Behar.

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123. A putta or lease, from 1240 Fuslee, from the Government Ameen, in which they are designated "lumbardar kudeem."

124. Their own witnesses, and the witnesses of the opposing claimants, declare that the zemindaree belongs to them. The putwaree declares to the same effect, and that the lands are divided among them.

125. This is stated in the evidence on the chowdree's claim.

126. A bhyachara partition of the lands in the village, which is irrefragable proof of proprietary right—orchards and land granted rent-free.

127. The Collector has placed the estate in the 1st class, and I confirm his decision.

No. XIII.

Case of Mouzah Botum.

KHOOMAN AND DULLEEP, as the heads of a Byse Thakoor resident community, including a Brahmin and a Kaet family, claim the zemindaree as their ancestral and immemorial property and adduce the following proofs.

128. A wasilbakee from the ancient canoongoe records (of the authenticity of which I entertain no doubt) dated 1129 Fuslee, 1722 A. D., for this village, in which are entered as malgoozars, without specification of tenure, Hurree Singh, an ancestor of the Byse claimants, and Hakim Wasil Khan.

129. A wasilbakee dated 1178 Fuslee, 1771 A. D., in which are entered as malgoozars Nihal Singh, Juggey, Inderjeet, Rae Singh. Of these, Nihal is a relative of the claimants, and also Juggey: no specification of tenure.

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Another of the same date; the names Juggernath or Juggey, Rae Singh, Sewa Muhadee, Nihal, Bhowanee, Juggey, Nihal and Muhadeen, are of the claiming family.

130. Another of the same date—Nihal, Inderjeet, Jykishen, Bhowanee. Of these, Nihal is of the claiming family. These papers of the same date are for different muzrehs or hamlets of the same muhal of Botum. A wasilbakee for 1183 Fuslee, 1776 A. D.; the names are Juggurnath and Nihal Singh, zemindars, both of the claiming family.

131. A kubooleeut dated 1188 Fuslee [1781 A. D.], executed by Juggurnath, Himmut Singh, Lall Suhai, Nihal Singh, zemindars—all of the claiming family.

132. The claimants put in the following documents:—

A perwannah without date from Nawab Mahomed Munowur Khan, Jagheerdar, to Nihal, Lall Suhai, and Himmut Singh, zemindars, directing them to attend to the requisitions of one of his officers sent to the village.

A putta from Namdar Khan dated the year *four*, of the reign of Shah Alum (1168 Fuslee), for Mouzah Hasheepore, to Ruttun Singh and Lall Suhai, zemindars of Mouzah Botum.

A putta dated 1198 Hijree [1776 A. D.] for mouzah Botum from Munowur Khan, Jagheerdar, to Nihal, Himmut, Lall Suhai, Juggurnath, Mungul Singh, and others, zemindars. This corresponds with the wasilbakee of the same date in the canoongoe's records.

A receipt, without Hijree date, for the month Jumadoosanee, from Gool Mahomed, for the revenue of Botum, granted to Nihal and Himmut, and Lall Suhai for 1173 Fuslee [1766 A. D.].

133. There is a division of land among the claimants. At the inquest taken by Dirgopal Singh in 1828, the claimants are returned as the zemindars.

134. Oral testimony is borne by all the witnesses examined to the truth of their claim.

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135. One holder of pydaruck land declares he holds the lands from the grant of the claimants' family.

136. The claimants are now in possession under a lease from the person to whom the village is mortgaged.

137. The Jagheerdar opposes the claim. He adduces a story that the zemindaree of the claimants was annulled by the ruler Muzuffur Jung, and conferred on the chowdree Muhanund.

138. And at the same time, before the Deputy Collector, makes the contradictory statement that these people were a short time ago brought from mouzah Poora, pergunnah Suckutpoor, by the chowdree's family. He denies also the partition of the lands ascertained by the Deputy Collector, Kalee Rae; but a further enquiry made on his denial only confirmed the fact.

139. He objects to the anomaly of a Brahmin and Kaet family being found in a Thakoor community; but they have come in by conveyance of the lands they hold from the Thakoor community to them, and the anomaly only confirms the facts of proprietary right.

140. The Collector places the state in the first class, and I confirm his decision.

No. XIV.

Case of Mouzah Bhubooteepoor.

141. In this case it is perfectly clear that the zemindaree right and malgoozaree occupancy were held in the name of Gopal Singh from 1205 Fuslee, one of a Thakoorwar family, who are shown by the ancient records and accounts to have been the zemindars of Muchoopoor and Bhubooteepoor. In 1205 Muchoopoor went to the community of whom Bahadoor Singh is the head; Bhuboo-

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teepoor (as above) to Gopal Singh; Deenarpoor to Purmesree Doss Brahmin—the three up to this time having formed one mehal called Muchoopoor. Gopal Singh died about 20 years ago leaving a son; Anund Singh, resident in Mohumdeea, zillah Mynpoory, and Jhunda Singh, Bhuddowreea, and Oomrao Singhee Thakoor, his relations by marriage with the females of Gopal Singh's family. These two last are resident in the village and cultivate there. The Collector has decided that this village comes under the 3rd class. This decision I confirm. A claim was brought before me by the head of the community who held Muchoopoor, but in my opinion it is barred altogether by the partition which evidently took place in 1205. It is to be noted that malikana, as appears from the ancient accounts, was allowed in 1205 Fuslee, 1206 Fuslee, as follows:—

Muchoopoor.	*Bhubooteepoor.*	*Deenarpoor.*
Muhceput Singh.	Gopal Singh.	Purmesree Doss.
50 Rs.	24 Rs.	24 Rs.

142. From Muheeput descend the family who hold Muchoopoor and claim Bhubooteepoor.

No. XV.

Case of Mouzah Muchoopoor.

143. In this case no opposition is made by the Jagheerdars. The enquiry shows that the zemindaree belongs to a family of Thakoorwar Rajpoots, who have held as theekadars certainly from 1205 Fuslee down to the present day, with the exception of the entry of a stranger from 1236 to 1241 Fuslee as farmer tenant. This is a branch of the Bhubooteepoor and Deenarpoor families—to which refer; they hold a considerable quantity of land in the village. The Collector has decided that these people are entitled only to be placed in the 2nd class of

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proprietors as laid down in the Lieutenant-Governor's instructions; but it appears to me that the tenure has all the incidents necessary to range it in the 1st category; and this I have ordered to be done on the appeal of the parties.

144. I have also directed the khewutnameh, or statement of liabilites to be drawn; and I have instructed the Collector to decide a subordinate claim on the part of one of the family, named Bichutter Singh, who has given in a petition to me.

Under para. 145 of Board's Settlement Circular.

No. XVI.

Case of Mouzah Dhundhownee.

CLAIM of Khooshial and others.

145. These parties being the head of a community of Gourt Thakoors claim the zemindaree as their ancestral property. They urge in proof that they and their ancestors have continually held the malgoozaree under the Jagheerdar, Khirudmund Khan, and after his death; that there are orchards and wells belonging to them in the village, and known biswah shares in the property, and that conveyances have been made among each other of these shares.

146. They put in as documentary evidence,—

A perwannah from Khirudmund Khan, Jagheerdar, to Bhoja and others, their ancestors, in which they are designated zemindars, dated 1216 Hijree, 1208 Fuslee.

Receipt from the Jagheerdar for Rs. 200 to Bhoja and Himmut, their ancestors, being rent paid for 1220 Fuslee.

Perwannah to Himmut Singh and others, their ancestors, zemindars, from the Jagheerdar, ... { 1230 Hijree. / 1222 Fuslee.

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Ditto, ... { 1230 Hijree. / 1222 Fuslee.

Ditto, ... { 1227 Hijree ; seal not legible. / 1219 Fuslee.

Order to Kurum Khan to send in the above Bhoja, zemindar of Dhundhownee ; seal not legible, ... { 1227 Hijree. / 1216 Fuslee.

Receipt from the tehseeldar of Talgram to Khoshial and Himmut Singh, the claimants, zemindars of Dhundhownee, 1243 Fuslee.

147. The Jagheerdar pleads in opposition, *1st*, that these persons are not the zemindars ; *2nd*, that sometimes the claimants and their ancestors had the village in farm, but merely as farmer tenants ; *3rd*, that in the time of Mr. Wright, the claimant's tribe became contumacious, and that the troops of Government were marched against them, and they were turned out of the country ; *4th*, that when the estate was leased to them in A. D. 1830, their kuboolent (or counterpart lease) contained a declaration by them, that they were mere ryuts, and had no right to the land ; *5th*, that the ancestors of the claimants came from Cawnpore 50 years ago ; and that the father of Ruttun Singh, one of the claimants, gave up his daughter as a concubine to Chowdree Muhanund who settled the tribe in the village ; *6th*, that (as above stated) when the tribe would not pay their rent, the Jagheerdar wrote to the Judge and Magistrate, Mr. Wright, who took troops to the place, destroyed the houses of the defaulters, tore up their orchards, and prohibited them from coming within twelve miles of the place. The Jagheerdar filed as documentary evidence the kubooleeut above mentioned.

148. On reference to the ancient and authentic records and documents of the canoongoe's office, it appeared that

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in 1178 Fuslee, Kunjun Singh was the malgoozar or tenant; that in 1182 Fuslee Kunjun Singh and Sookhanund were malgoozars: that there is a kubooleeut for 1188 Fuslee, to which the parties are Oomed, Sookhanund, Kunjun Singh, and Keerut Singh, *erugmal**; which last word is a Turkish word signifying a hostage.

149. That there is an ancient paper of partition in existence (furd tufreek) to this effect:—

Mouzah Dhundhownee.

Turf Nuddee.	*Turf Puduk.*
Kunjun and others.	Sookhanund and others.

That in a wasil bakee dated 1183 Fuslee, there is this entry:—

"Jagheer Monour Khan,† talooqua Botum."

Village Dundhownee (bumoojub) according to Kunjun Singh and Sookhanund.

Aslee 1 mouzah.

2,201 Rupees, ... Minhaee, 100; Balance, 2,101-0-0.
Received, *viz.*:—

By the Nawab,...	971·2	
By the khansamas, ...	57	1,028-2-0

Balance, 1,072-14-0.

150. The inference of the Deputy Collector is that the Rs. 100 was a malikana allowance to Kunjun and

* It was customary on granting a lease of this kind for the rude Mahomedan rulers to detain one of the lessees in custody as a hostage or 'erugmal' for the rest.

† Monour Khan was the paternal uncle of Khirudmund Khan the Jagheerdar.

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Sookhanund. The Deputy Collector also thinks that after the words "bamoojub," the word kubooleeut or lease has accidentally been omitted by the scribe.

151. In a list of farms leased by kubooleeut this village is entered as being held by the kubooleeut of Sookhanund, Omed Singh, Chet Singh, and Keerut Singh ; and in a specification of the instalments by which the rent is to be paid, these last names are quoted as being those of the zemindars.

152. There is also for the same year a list of the hostages of the pergunnah of Bygowan to this effect.

153. Dhundhownee, Oomed, Sookhanund, zemindars; erugmal, the son of Sookhanund : dhakilee Sirkar, 23rd Shuwal.

154. Meaning that Oomed and Sookhanund are the zemindars; that the son of Sookhanund was the hostage, and had come in to the Government on the 23rd of the month Shuwal.

155. All the persons mentioned in these ancient documents, with the exception of Gungaram, are of the family of the claimants.

156. By a reference to the documents filed by the claimants, it is fair to infer that they continued in possession perhaps uninterruptedly certainly at various periods, from 1208 Fuslee, down to 1222 Fuslee.

157. When the Jagheer was attached on the death of Khirudmund Khan by the Collector in 1235 and 1236, the settlement of the village was made with the claimants; and from 1240 to 1246, when the Jagheer was again attached by the Collector, the settlement was again made with them.

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158. In 1247 Fuslee the Jagheerdar rented the village to Koshial and Ruttun, claimants, during the interval, and at present it was and is held kham.

159. In a report made by Dirgopal Singh, Government Tehseeldar, in 1235 Fuslee, the claimants were declared to be the zemindars.

160. The official report of the canoongoes is to the same effect.

161. Further, this community, and that of the bhyachara community of the contiguous village of Shurreefabad, are descended from one stock. It is clear from the proceedings held on Shurreefabad that Shurreefabad and Dhundhownee were once held in common by the whole brother hood, but were divided into two parts, *viz.*, Dhundhownee and Shurreefabad, as they now stand. The ruins of a large fort on a high mound lie between the two villages. The right to these has just been vehemently disputed between the claimants and the Shurreefabad zemindars, independently of the Jagheerdars, who did not care about the matter. It was impossible to say to which village the fort belongs, but a jury of arbitrators assigned one-third of the site to Shurreefabad, and two-thirds to Dhundhownee.

162. Again, there are a wood and shrine on the boundary of these two villages. The god is a divinity called Chandun. The wood was formerly undivided, but now the boundary has been run through it, by which the shrine comes into Shurreefabad to the infinite annoyance of the claimants. It is the ancient custom of the two gotes or divisions of the tribe, together with the division who live at Neeamutpoor, to worship this god all together once a year at the Holee. The males, adult and minor, on this occasion assemble and renew and acknowledge the tie of relationship.

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163. Besides, the fields of Shurreefabad and Dhundhownee are to this day to some extent khet-bhut, or interspersed—that is, some of the fileds of the one village are within the area of the other, and *vice versa.*

164. The common name of the clan is Gour Thakoor, but the two septs are distinguished as the Bhugeroo and Lugeroo branches; and the family name has become local—the village of Dhundhownee being styled in the wasilbakee account of 1188 Dhundhownee Luckeroo.*

165. They were anciently two thokes or divisions of the area—thoke Nugdee and thoke Puddee.

166. This partititon no longer subsists, but the claimants still define their several rights by it in this way.

Thoke Nugdee : 10 *biswahs.*

Khoshial	Ruttun Gundhurp	Futteh
$4\frac{1}{2}$.	$2\frac{3}{4}$	$2\frac{3}{4}$ of which $1\frac{1}{4}$ beegah is mortgaged to Ruttun and Gundhurp.

Thoke Puddee : 10 *biswahs.*

Muheeput, (living in Korara)	Heera,
5.	5 (mortgaged to Ruttun.)

167. There is also an old undated partition paper in the canoongoe's office, in which thoke Nugdee is set down at Rs. 1,155, and thoke Puddee at Rs. 1,155.

168. This division in conformity to biswahdaree right has perished, and the village is now occupied as follows:—

In nuglah or hamlet Lalpoor lives	Heera,	thoke Puddee.
In Korera, ...	Muheeput,	
In Nusseerabad, ...	Narain,	

* In the same way we have in England Torr Mohun, Berry Pomeray, Stoke Dameral, &c. &c.

169. Kooshal, Gundhurp, and Ruttun live in nuglah Ungud, and Futteh Singh lately lived in nuglah Gokroo. All these nuglahs have separat ed boundaries, and lie within the area of Dhundhownee.

170. In nuglah Ungud are two chowpals and an *imlee* tree. It is the custom of the muhal that no charge can be allowed as village expenses, unless it be first passed in an assembly of all the proprietors of the above nuglahs under the *imlee* tree.

171. The claimants and their family hold seer land in large quantities and at low rates.

300 beegahs, 9 biswahs, Dhundhownee Khas.

112 ditto, 11 ditto, Nusseerabad.

172. The land is of the best quality, and what is called *Gohanee*, or near the village site; yet the claimants pay in Dhundhownee only Rs. 1-9½ per beegah, and hereditary ryots Rs. 2-5-0

173. In Nusseerabad the claimants pay 13 as. per beegah, and ryots Rs. 2-13-0.

174. The hereditary ryots all declare the claimants to be the zemindars, and that themselves were settled in the village by the ancestors of the claimants.

175. The Deputy Collector, Kalee Rae, pronounced the body of evidence to be irresistible, and observed, with regard to the pleas put in by the Jagheerdar, that the above proof disposes of the 1st and 2nd pleas—namely, that the claimants are not zemindars, and that their possession was merely that of farmer-tenants; that with regard to the 3rd and 6th, *viz.*, their dispossession by Mr. Wright, the Judge, no evidence is proffered: and that he has in vain searched the criminal and police records, where some

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notice of such a proceeding must have existed had the fact been as stated. With regard to the 4th plea, *viz.*, the kubooleeut, he remarks, that the Zemindars deny the authenticity of the document, and that it is remarkable that the names of all the witnesses should be Saads of the tribe and family of the attorney of the Jagheerdar.

176. With regard to the 5th plea, *viz.*, the settlement of the ancestors of the claimants only 50 years ago by Chowdree Muhanund as ryots, the Deputy Collector states the contrary to be the fact. Chowdree Muhanund attacked those persons, and defeated them, and carried off forcibly the sister of Ruttee, the claimant, and so notorious is the fact, that the matter is the subject of a legendary song current throughout the country.

177. He states that the putwaree's papers are in such a state that it is impossible to ascertain how profits were shared by the members of the community; but it is clear that all the putteedars or sharers are in the enjoyment of their seer land. He concludes that the claimants have made out their case, and that the tenure ought to fall in class 1st.

178. The Collector reviewing the case says that the Jagheerdar urges that the claimants were driven out and the habitations destroyed by the officers of Government; and that the claimants admit that their houses were thrown down, and their orchards rooted up; and it is clear that they filed afterwards the kubooleeut denying their right, which is put in by the Jagheerdar. On these accounts the Collector declares that they, the claimants, have no right.

179. It is evident that the first reason given by the Collector is good for nothing. If the Collector assumes that the acts ascribed to Mr. Wright are evidence of a

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legal confiscation which extinguished the right of the claimants, it is clear that he is taking worse evidence when he could get better.

180. A legal confiscation admits of direct and complete official proof, and cannot be inferred from a statement of the commission of that which, if it occurred, except in process of legal confiscation, was a fearful outrage. If there was no confiscation, the occurrence does not bear on the question at issue.

181. The kubooleeut, for the reason assigned by the Deputy Collector, is most suspicious; and next, if the parties are not zemindars, why should the Jagheerdars have had this curious condition inserted in a counterpart lease? The document I hold is not legal nor formal. If the lease was a *bonâ fide* lease, the disavowal of the right inserted in it is extraneous, and no evidence. If the transaction was a contract, and the renunciation of the right was the consideration given for the obtaining the lease, thedocuments should have stated those facts plainly, and in their true light.

182. I annul the Collector's decision, and confirm that of the Deputy Collector.

No. XVII.

Case of Mouzah Shurreefpoor.

183. This is a very simple case. Rughobur Singh and others claim as the heads of a Byse Thakoor community. Their ancestors' names are entered as zemindars in the ancient records as far back as 1183, Fuslee [1776 A. D.]. They hold in imperfect putteedaree. Their claim is substantiated by full and credible oral testimony. It is acknowledged by the agent of the mortgagee

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in possession, who found them in possession when the village was made over by the mortgaging Jagheerdar, and has left them in possession ; intermeddling no further than to collect the jumma from the heads of the community. There is no opposition on the part of the Jagheerdar. The Collector has placed the village in the first class, and I confirm his decision.

No. XVIII.

Case of Mouzah Kootubpoor.

184. This is a similar case; the proof is full and complete, and the rights of Khoman Singh and Chain Sookh, claiming as the heads of a Byse Thakoor community, were acknowledged by the agent of the Jagheerdar. The Collector places the village in the first class, and I confirm the decision.

No. XIX.

Case of the Village or Mouzah Muddhee.

Claim of Eshree Singh, Byse Thakoor.

185. The merits of this case will be best set forth by a detail of those facts which are beyond doubt, from ancient documents in the Canoongo's office, of which the genuineness is unimpeachable. It is clear that Mungul Singh, Ghylwur Thakoor, was from 1134 Fuslee to 1184 Fuslee, the zemindar (being then so designated) and the malgoozar, for the payment of revenue by him, is entered in the accounts. At this time (1184) the names of Ummur Singh and Poorun Mull, son and father, appear as sharers with Mungul Singh. These persons were Byse Thakoors, and oral testimony proves them to be relations of Mungul Singh ; but how the zemindaree right came to them, whether by gift, devise, or inheritance, there is

no evidence. Ummur Singh was in possession in 1188 as zemindar, by the Canoongoe's documents. Ummur Singh was a member of the family who now hold Mouzah Rore in pergunnah Suckutpoor in zemindaree. Ruttun Singh, his son, succeeded Ummur Singh, and resided in the old fort of the village, and planted an orchard. From 1188 there are no accounts of the possession of the village till 1201 Fuslee, when it was leased with many others to the Chowdree of Bishungurh, Odey Chund. In his time a nankar of 50 beegahs was bestowed by the Jagheerdar on the widow of Ruttun Singh, who adopted the present claimant, Eshree Singh; and this grant was allowed by the farming tenant, Chowdree Odey Chund. The proofs are complete on this point in my opinion. The Chowdree remained in possession till the attachment in 1235 Fuslee, when the Tehseeldar enquired into the zemindaree, and by his inquest returned Eshree Singh as the zemindar. What happened in the interval is not to be traced in the proceedings, but at the second attachment, in 1241 Fuslee, Eshree Singh held the malgoozaree till 1246.

186. During this time, Eshree Singh remained in possession of this nankar till 1248 Fuslee, when he lost it under circumstances which will be hereafter detailed. In 1247 Eshree Singh brought an action before the Moonsiff of Chibramhow against the Jagheerdar for extorting rent from him on account of nankar. The Moonsiff decreed in his favour on the ground that he had proved the grant by the Jagheerdar above alluded to, and the confirmation of it by the Chowdree. Although Eshree Singh, in his petition of plaint, stated that the grant originated in his being zemindar, the Moonsiff took no notice of this point in his decision. An appeal was made to the Judge, who reversed the decree: first, because the land by the

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sunnud was granted to the widow of Ruttun Singh as *nankar* (thereby admitting *her* zemindaree right), and that Eshree Singh was her adopted son, and that she was alive and ought therefore herself to bring the action ; *Secondly*, that the action was brought against the agents of the Jagheerdar, and not against the Jagheerdar, against which last alone a suit could lie. He therefore reversed the decision, and decreed in favour of the appellants. He ought to have directed a nonsuit. The Judge took technical objections.

187. Eshree Singh being thus defeated, brought a fresh action in 1250 Fuslee before the Principal Sudder Ameen, Mr. Mercer, for the zemindaree. The unfortunate man had not in hand the proofs above detailed resulting from the Canoonge's records, but he set forth his possession under the Jagheerdars, and the grant of the nankar by the Jagheerdars in 1201, in compensation for the lease by which Odey Chund was admitted as farmer-tenant, and adduced oral evidence. The Principal Sudder Ameen, however, decreed against him.

189. The Principal Sudder Ameen, at the termination of his decree, says, that the plaintiff may, if he thinks he has any right, sue for his 50 beegahs of nankar. But it is plain that the right to the 50 beegahs rests only on the right to the zemindaree.

190. The zemindaree right has been hopelessly decreed away from the right owner, but the decree leaves the nankar land open to decision. It has been assigned by the Collector to the claimant, and the tenure has been placed in the 2nd class, a decision which I confirm.

191. To complete the incongruity of the whole proceedings, the Jagheerdar brought an action in 1842 A. D. for the rent of the nankar land, obtained a decree, and

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under it ousted Eshree Singh, and sold through the Court the village fort, which, if Eshree Singh was not zemindar, could not have been his property, and must have been that of the Jagheerdars. This action was brought prior to the decree alluded to in the preceding paragraphs, and was tried by the same Principal Sudder Ameen.

192. The defendant pleaded that the land for the rent of which he was sued was the nankar land, and not liable to rent. The Principal Sudder Ameen took not the slightest notice of this plea, but decreed in favour of the plaintiff: 1*st*, because he the defendant, Eshree Singh, cultivated the land; 2*ndly*, because when the crops were attached the year before, he gave security to procure their release; 3*rdly*, because he had paid nothing in 1248: on these grounds he decreed that he should pay Rs. 305 rent for 1247 and 1248 Fuslee.

No. XX.

Case of Mouzah Neamutpore oorf *Oomurpore.*

193. In this case the right, unopposed by the Jagheerdar, is proved to be in a Rajpoot family consisting of three members; but as they have never shared profits when they held the farm, but the farmer, whoever he was, took the whole profits, the others keeping their seer, the Collector has decided the tenure to be of the 2nd class, and assigned do-biswaee land to the zemindars. This decision I confirm. The parties have sometimes held the farm under the Jagheerdar, and at other times have been excluded, and the farm has been given to strangers. At present they hold the lease.

No. XXI.

Case of Mouzah Russoolpore.

194. One person, Mân Singh, a Byse Thakoor, is the sole proprietor, and has been in possession in the ancient

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records. The claim is not denied by the Jagheerdar. Do-biswaee land was decreed to Mân Singh, and the estate was placed in the 2nd class; and this decision I confirm. There is a subordinate claim on the part of Pran Singh, Lena Singh, and Teeluk Singh. They are confessedly of the family, and since 1249 Fuslee have got possession of 40 acres of land, of which they sometimes pay the rent, and sometimes not. Mân Singh says he got the whole possession of the zemindaree by paying the balance due from the ancestors of the claimants; and the evidence taken in some measure makes good his claim. I have directed the right of these claimants to a part of the do-biswaee to be tried under the settlement rules.

No. XXII.

Case of Mouzah Deyoopoor, Muzreh or Hamlet of the above Russoolpoor.

195. This estate follows the conditions of Russoolpoor, excepting that 90 years ago the ancestors of the Russoolpoor zemindars made over this muzreh to the family priest, and it is now held by the representative of the family priests. The claim is not denied by the Jagheerdar, and do-biswaee has been assigned to the incumbent. This decision I confirm. This endowment is a further and striking corroboration of the right of the zemindar of Russoolpoor.

No. XXIII.

Case of Mouzah Rughoonathpoor.

Claim of Eshree Singh, Gour Rajpoot.

196. He sets forth that the zemindaree is his ancestral property, and has been in his possession till 1236 Fuslee, when the estate was attached. Up to that time he and

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his ancestors had the possession and management of the village, and also malikana; that after 1236 Fuslee, he (Eshree Singh) caused the village to be given in farm to Dhara, Aheer, from whom, in his quality of proprietor, he, the claimant, receives to this day nankar. From his not being in the village, his ancestral fort and orchard are gone to ruin; but there are the ruins.

197. The Jagheerdar denies the right of the claimant *in toto*, and his whole statement. He states that he (the Jagheerdar), has always collected himself from the ryots or through a farmer; and if at any time the claimant happened to get the farm of the village, the being a tenant did not make him a proprietor. Since 1238 Fuslee the village has been farmed to Dhara, Aheer, and the leases are filed by the Jagheerdars in proof. If any malikana or nankar were allowed, such allowance must be in the putwaree's books; let them be referred to.

198. The claimantsput in 6 puttahs, in which his father was entitled zemindar, by the Nawab Khirudmund Khan, Jagheerdar, and by Dilawur Ali Khan, an officer of the Jagheerdar.

199. Areference to the old records and accounts shows plainly that the father of the claimant was in possession, as proprietor, up to 1216. How he was dispossessed is not in evidence. The same records show the same person as zemindar in 1212. The proof of the allowance of malikana, by the farmer and Dhara, failed.

200. The Deputy Collector, acknowledging the right of the claimant, decreed against him, as having been out of possession, and not holding land or being resident for 37 years.

201. The claimant has appealed to me without raising any new point.

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202. I have rejected the appeal, and confirmed the Collector's decision.

No. XXIV.

Case of Mouzah Secunderpoor.

203. In this case the proofs are complete in favour of a family of Ghylwar Rajpoots. They consist of possession before and after the cession to the British Government, proved by official documents, present possession, and mortgage made by the claimants. The claim is not denied by the Jagheerdar. The tenure is zemindaree—that is, the sharers divide profits and losses by the biswahdaree share, but do not divide the land. The estate has been placed by the Collector in the second class; but it is clearly a first-class estate, and I have ruled accordingly.

No. XXV.

Case of Mouzah Shurreefabad.

Claim of Byjoo Singh and Others, Gour Thakoors.

204. They claim the zemindaree of Shurreefabad as their ancestral property now in their possession. The Jagheerdar has made no opposition. These people are a sept of the same clan who hold Dhundhownee; *quod vide.* All the general evidence, detailed under the head of Dhundhownee, equally applies to Shurreefabad.

205. The ancient records in the custody of the Canoongoes prove proprietary possession, as far back as 1183 Fuslee.

206. The inquest of Dirgopal Singh, tehseeldar, in 1235 returned them as zemindars.

207. The official report and testimony of the Canoongo are to the same effect.

208. Purwannahs and a receipt from the Jagheerdar designated the claimants as zemindars.

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209. A purwannah from the Collector dated 1820 A. D, directed to Ummur Singh and Bukhtawur Singh, zemindars of Shurreefabad; Bukhtawur Singh, inhabitant of Durown; and Omed Singh, farmer of Bukholee, appointing them arbitrators to settle a boundary dispute between Doorown and Omur.

210. The evidence of the hereditary ryots holding rent-free land in the village, and of neighbours of respectability, and of the hereditary putwaree.

211. The tradition of the country is that before the British rule, the Rajah of Mynpoorie endeavoured to encroach on the boundary of Shurreefabad, and that a battle was fought between him and the zemindars; the issue of which was their defeat and slaughter, and the capture by the Rajah of the fort of Shurreefabad. This fort is now the residence of the claimants.

212. There is a partition of both land and jumma in the village, though a considerable portion is held in common. They pay according to this partition. Shares have been mortgaged, and disputes exist to this day in regard to these mortgages. The lands are still partly "*khet bhut*" with Dhundhownee; and till this enquiry was made, the site of the fort was still held in common —it is now divided by an arbitration. Ancient orchards, planted by the ancestors of the claimants, are in their possession, as is also the fort.

213. The Collector placed this village in the first class, and has made a settlement with them. This decision I confirm.

No. XXVI.

Case of Mouzah Dowlutabad.

214. The decision of this case is still delayed in consequence of the difficulty of obtaining some material information from the Dewanny Court.

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No. XXVII.

Case of Mouzah Mirzapore, Hamlet of Omurpore, Hamlet of Sukrawah.

Claim of Kamraj, Aheer.

215. He claims the zemindaree, as having been purchased from the original zemindars, the Chowdrees of Sukrawah.

216. He puts in, as documentary evidence, dakhilas granted to his ancestors.

217. The Jagheerdar does not oppose his claim. The Deputy Collector considers him to have proved possession as proprietor by his own documents, and the records of the Canoongo from 1127 Fuslee down to the present day; that he is now in possession; but as there is no community sharing profits, the Deputy Collector places the tenure in the second class, and assigns to Kamraj do-biswaee land.

218. The Collector takes up the point, that the claimant is the illegitimate descendant of the original parties holding from 1127 Fuslee, and declares the tenure ryotee, and of the third class.

219. I differ. This objection may be urged in a Court of Dewanny Adawlut as against Kamraj, by the legitimate descendants who are in existence; but they waive their claim.

220. I upheld Kalee Rae's decision.

221. One of the Sukrawah Zemindars brought up his claim, and denied the conveyance to the claimants' ancestors; but on such a ground it is impossible to upset a proved possession of nearly 100 years.

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No. XXVIII.

Case of Mouzah Beerpore.

222. The claimants here are a family of Aheers; and their possession, as tenants, is made out from authentic documents down to 1230 Fuslee, or 1827, when the then Jagheerdar died, and the estates were attached. Many of the documents establish their proprietary right; and though, on the attachment, they lost their tenancy, they still held, and hold, their seer lands as favoured cultivators. Their claim is further proved by the existence of a fort built by their ancestors. The tenure is after the custom of the Aheers in this part of the world. They take to each other different poorwas within the same mehal, and remain in separate possession of these poorwas. A singular and late exercise of proprietary power took place some years ago. In 1238 Hijree, 1823 A. D., Himmut, who holds the poorwa called Nuglah Kutelah, wanted to build a house in the abadee or village site of Beerpore. The holders of Beerpore opposed this. The Jagheerdar interfered in favour of Himmut; but in vain. The Jagheerdar was forced at last to give up two beegahs of land *near* the abadee, on which Himmut built his house; but into the abadee he could not come.

223. There is an immense body of oral evidence, and the testimony of grantees of rent-free land, to the effect that some of them have held grants from the ancestors of the Aheers for 100 years.

224. The Collector decreed in favour of the claimants, and placed the estate in the second class; "for," said he, "the lands are not divided."

225. The tenure is evidently one of the first class, and I have ruled accordingly.

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No. XXIX.

Case of Mouzah Khem Kurn.

226. The claim of a community of Lodas has been admitted by the Collector, and is not denied by the Jagheerdar. The proofs consist in the possession of the ancestors of the claimants, as shown in the ancient records; and the subsequent possession of the present claimants, and the division of the land among them into thoks. The proof is full, and I confirm the decision, which places the tenure in the first class.

227. A map of the pergunnah, and the correspondence, are forwarded with this report.

I have the honour to be, &c.,

FRANCIS ROBINSON,

Commissioner.

Commissioner's Office,
Agra Division:
The 3rd April, 1847.

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STONE QUARRIES.

No. 1.

STONE QUARRIES AND ROADS.

From F. H. Robinson, Esq., *Commissioner of Agra Division, to* J. Thornton, Esq., *Secretary to Government, North-Western Provinces, Judicial Department* (No. 26).—*Dated 9th July, 1845.*

Sir,—I have the honour to submit, for the consideration of His Honor the Lieutenant-Governor, such information as I have been able to obtain on the subject of your Letter No. 4,760 of 1844, together with all the correspondence that has taken place on the subject.

2. We must set out with allowing, that the ordinary metalled roads of the country cannot bear the immense weight of the salt carts. This experience has proved. The metalled roads are either uniformly destroyed by this traffic, or the road is preserved by excluding the traffic, and forcing it on a line parallel or nearly parallel.

3. The accompanying map will show at a glance the course of the traffic through my division—the different lines of commercial intercourse are marked in yellow, and the Customs line by a broad red line.

4. The line of traffic of most importance is that from Noh in the Delhi territory, which would, at Kosee, take up the large traffic between Delhi, Muttra, and Agra; but he distance is too great for a first experiment, and there is an insuperable difficulty in procuring stone fit for a tram-road. The rocky hills near Noh do not possess, I am given to understand, any known quarries of suitable stone—and it is evident, that wheresoever our road proceeds, it must begin at the quarries, and thus be enabled by the facility of carriage to, as it were, make itself.

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5. There are two sets of quarries available—one at Roopbass, in the territories of the Rajah of Bhurtpore; the other at or near our town of Jugnere, in Pergunnah Sirhinde.

6. If the road commence from Roopbass to Agra by the Chowkee of Bichpoorie, it will, besides facilitating the commerce in stone, and considerably lowering the price of that useful article, at once become available for a great part of the commerce in sugar, salt, and cotton, now moving on the many lines converging at Bichpoorie. The commerce on customable goods which has passed Bichpoorie amounts to the values shown in the annexed return.

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Memorandum of the trade that has passed the Bichpoorie Chowkee from Feby., 1844, to Feby., 1845.

Year.	Month.	Salt.			Sugar.			Cotton.			Remarks.
		Quantity.	Value.	Duty.	Quantity.	Value.	Duty.	Quantity.	Value.	Duty.	
1844	February, ...	78,894	2,46,895	1,57,680	2,754	10,587	662	15,263	1,52,630	7,631	In these months the trade of the Pengree Chowkee is included in the Bichpoorie statements; but it is very trifling, and consists chiefly of cotton and sugar.
	March, ...	61,799	1,88,187	1,23,599	6,400	28,800	1,800	35,080	3,50,800	17,540	
	April, ...	61,272	1,89,407	1,22,545	7,118	52,349	3,085	20,415	2,04,150	10,207	
	May, ...	77,462	2,35,444	1,54,868	8,341	50,978	3,186	10,263	1,02,630	5,131	
	June, ...	52,658	1,58,293	1,05,070	2,973	14,744	921	6,776	67,760	3,388	
	July, ...	11,142	33,466	22,242	882	5,321	332	3	30	1	The value of the trade has been estimated thus:
	August, ...	24,383	73,280	48,717	403	2,279	143	...	...	...	Balumba salt, at Rs. 3 per maund.
	September,...	49,249	1,47,809	98,498	1,376	8,068	504	...	...	...	Sambhur do. at Rs. 4 per md.
	October, ...	85,258	2,55,837	1,70,516	4,674	33,452	2,091	196	1,960	98	The fine sugars Rs. 8 per do.
	November, ...	73,209	2,21,138	1,46,419	3,387	25,081	1,567	2,573	25,730	1,286	Goor, at Rs. 3 per do.
	December, ...	31,002	96,568	62,003	2,585	19,980	1,249	13,653	1,36,530	6,827	Cotton at Rs. 10 per do.
1845	January, ...	40,322	1,34,535	80,644	2,310	16,030	1,002	17,070	1,70,700	8,535	
	February, ...	34,327	1,03,768	68,655	2,220	13,550	847	8,962	89,620	4,481	
	Total, ...	6,80,977	20,84,627	13,61,456	45,423	2,81,219	17,389	1,30,254	13,02,540	65,125	

M. C. HICKIE,
Deputy Collector.

7. The quarries at Roopbass belong to the Rajah of Bhurtpore. They furnish two kinds of stone, both good; but the grey stone is the best, and the red is somewhat inferior and of a loose grain. The price of the grey stone at the quarries is Rs. 13 per 100 maunds, which I found by actual measurement to represent 68·48 cubic feet. The actual price of this mass is Rs. 7; but in addition the Rajah takes a duty of Rs. 5-8, and the Putwaree 8 annas as his fee. This price of Rs. 7 represents the value of the stone quarried into any rectangular form.

8. The price of the red stone is, for the same quantity, Rs. 6, and the Government duty in addition is Rs. 4-8, and the Putwaree's fee 8 annas; and 100 maunds contain by measurement 85 cubic feet. The cost of carriage of 100 maunds weight to Agra, a distance of 33 miles, is on an average Rs. 20; to Muttra, distance 36 miles, Rs. 17; to Bindrabun, distance 41 miles, Rs. 15; but the prices vary with the scarcity or plenty of carriage. There are a greater number of return carts passing to Muttra and Bindrabun than to Agra, and the road is harder and better. This accounts for the cost being less for the longer distances.

9. A cart laden with 15 maunds and drawn by two bullocks, will go five koss, or 10 miles, in a day. A four-bullock cart will take 30 maunds the same distance in the same time; and an eight-bullock cart, 60 maunds. This is the greatest load ever taken; 50 maunds is an usual load for an eight-bullock hackery. The above rates are calculated for tolerably hard roads, but if any length of sand intervene, a cart will barely make 3 koss in a day.

10. I applied to the Rajah of Bhurtpore to inform me what quantity of stone was quarried in the course of the year, and whither it was sent. The last question he could not answer, but it appears that in 1252 Fuslee there were

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quarried 2,05,000 maunds of grey stone, and 1,80,000 of red.

11. The Rajah expressed his readiness to allow the British Government to take as much stone as they choose for the purpose of the road, duty free, but much of the benefit of the road will be lost, as far as the price of the stone is concerned, if the Rajah persist in levying the present extravagant duty.

12. The other set of quarries are situated at Bhagour, Tautpore, Kussuktar, Busye and Jugnere (marked with an asterisk in the map), and there are altogether 68 quarries open. They furnish both grey and red stone, and the grey stone is very much superior to that of the Roopbass quarries.

13. The following table shows the result in cubic feet of the measurement of pieces of stone representing the maund weight.

Bhagour quarries :—		
		Mds.
	Red stone, ...	100=119·7 cubic feet.
Busye quarries :—		
	Red only, ...	100=147·68 ,,
	Grey only, ...	100= 94·5 ,,
Tautpore quarries :—		
	Red, ...	100=125·8 ,,
	Grey, ...	100= 71·47 ,,

14. The price of the stone at the quarries is, per 100 maunds—red, Rs. 5; grey, Rs. 7; and the cost at Agra is—red, Rs. 21 per 100 maunds; grey, Rs. 23: the carriage being Rs. 16 per 100 maunds. I am informed that the Zemindars have got a monopoly of the carriage of the

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stone, and that this is the principal source of their gains from the quarries. They allow no one to work the quarries who does not employ their carriage.

15. The zemindars levy a cess of 4 annas per adze on the miners who work the quarries, and the collections made in this fashion are stated by the Putwarees to be as follows :—

1,249	1,250	1,251

44,182 mds., Rs. 89 ; 46,289 mds., Rs. 96; 45,269 mds., Rs. 201; but this account is evidently, as far as the amount of duty goes, unworthy of credit. In some years, in lieu of a cess, the zemindars take stone, of the amount of which no account is submitted.

16. If the tram-road be made from the quarries of Jugnere to Agra, it will probably run through or near the Customs post of Mulpoorah; I therefore insert an account of the trade of that Chowkee.

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Memorandum of the Trade that has passed the Mulpoorah Chowkee from February, 1844, *to April,* 1845.

Year.	Month.	Salt. Quantity.	Salt. Value.	Salt. Duty.	Sugar. Quantity.	Sugar. Value.	Sugar. Duty.	Cotton. Quantity.	Cotton. Value.	Cotton. Duty.
		Maunds.	Rs.	Rs.	Maunds.	Rs.	Rs.	Maunds.	Rs.	Rs.
1844.	February, ...	0	0	0	1,185	6,986	478	7,714	77,144	3,857
	March, ...	14	28	28	1,595	5,419	505	8,403	73,270	4,200
	April, ...	82	324	164	2,402	9,893	841	9,424	94,241	4,712
	May, ...	0	0	0	4,252	21,949	1,507	4 597	45,967	2,298
	June, ...	671	768	708	2,562	17,885	966	2,135	17,076	1,067
	July, ...	178	424	311	816	959	296	61	476	31
	August, ...	122	285	214	482	2,304	145	9	64	5
	September, ...	183	419	300	1,608	10,616	565	7	53	3
	October, ...	326	1,170	641	3,021	17,753	958	84	588	38
	November, ...	128	599	255	3,169	15,426	868	1,030	7,945	501
	December, ...	22	64	43	1,877	14,771	762	6,997	55,019	3,455
1845.	January, ...	439	1,748	877	2,486	21,470	1,105	9,432	75,377	4,712
	February, ...	33	132	66	2,598	16,928	919	12,146	97,159	6,073
	March, ...	92	366	183	3,192	18,679	1,010	10,578	84,625	5,289
	April, ...	736	2,795	1,470	3,912	27,713	1,450	10,311	82,283	5,147
	Total, ...	3,026	9,122	5,260	35,157	2,08,751	12,375	82,928	7,11,287	41,888

M. C. HICKIE,
Deputy Collector.

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17. I am clearly in favour of the road being made from our own quarries of Jugnere. We have a better stone—a cheaper stone. We have no oppressive tax on the commodity as in Bhurtpore. It is true, that there does not run so great a traffic on the Jugnere and Mulpoorah line as on the Bhurtpore and Bichpooree line. But I confess I look more in the first instance to the facility of getting the stone and the lowering its price than to the conveyance of goods. That is to say, in the commencement, let us get a good supply of cheap stone, and let the practicability of the tram-road be proved, and we may then run a road from Agra to Delhi, which will be a real benefit to the commerce of the country. The first point is to get a cheap supply of stone to Agra, and it is clear that for this purpose Jugnere will suit us better than Roopbass.

18. There is but one thing more that I wish to allude to—that is, the necessity of hitting on some contrivance by which the cattle which draw the carts of the country may be made available for the tram-road. By the native mode, the cattle work in the trams, and the smoothness which facilitates the propulsion of the cart interferes with and almost renders nugatory the muscular action of the bullocks.

21. If successful, besides the advantage of the road for traffic, we shall, as it were, have brought the quarries to the banks of the Jumna; and I have no doubt that the stone will be sold as cheaply at Allahabad as it is now at Agra.

22. I regret that the information which I have been able to supply has been so scanty, and have the honour to submit all the correspondence that has passed.

COMMISSIONER'S OFFICE,
AGRA DIVISION:
The 9th July, 1845.

I have, &c.,
F. H. ROBINSON,
Commissioner.

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No. 2.

STONE QUARRIES IN THE NORTH-WESTERN PROVINCES.

[THE following four papers upon Stone Quarries are the result of a call made by the Government for information on the subject. They contain many valuable details in a matter which has hitherto received little attention; and though, in some respects, they are incomplete and imperfect, it is hoped that their publication may be the means of stimulating enquiry and of eliciting further information.]

REPORT ON THE STONE QUARRIES IN THE DISTRICT OF AGRA, BY MR. P. B. REID, DEPUTY COLLECTOR, DATED 17TH NOVEMBER, 1846.

Locality and number of quarries.

Stone quarries exist in 3 pergunnahs of this district; *viz.*, Futtehpore Sikree, Surhendee, and Furrah. Their locality and present number are as follow:—

PERGUNNAH FUTTEHPORE.

In Qusbeh Futtehpore, ...	11	Five on *milkee* lands, and six on *khalsa.*
In Mouzah Dahur, ...	2	
In Mouzah Tejpore, ...	3	*Maâfee* village.
In Mouzah Goor-ke-Mundee,	1	
In Mouzah Joutana,	5	
In Mouzah Mundee Mirza Jân, ...	1	
In Mouzah Bhurkoul, ...	2	*Maâfee* village.
Total, ...	25	

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PERGUNNAH SURHENDEE.

In Mouzah Jugnair Bussye,	13
In Mouzah Tântpore Ghuskutta, ...	11
In Mouzah Bhagour,	4
Total, ...	28

PERGUNNAH FURRAH.

In Mouzah Dhanowlee, ...	8
In Mouzah Nunwarah, ...	8
Total, ...	16

In all, 69 quarries.

Specimens of stone. Specimens of stone from the several quarries, labelled, and accompanied with lists, &c., have been forwarded to Mr. Middleton, Principal of the Agra College, as directed.

Proprietorship. No correct information can be got from the Canoongoes or their old *mouzeenahs* as to the exact position of the former Government in respect to these quarries.

Tax levied by Native Government. Same continued by our Government. When taken off. A tax, or toll, of 8 annas a month on each of the Futtehpore *khalsa* quarries, is said to have been levied on the parties working them (those on *milkee* land have never paid a toll), and this seems to have been continued by our Government till the revised settlement, when the toll on the quarries, in com-

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mon with other *rukoom-i-suwaee*, was taken off by the Settlement Officer; but no reason for so doing is given in the settlement records. The sums credited to Government in the Collector's books for three years antecedent to the settlement are stated in the margin. From the quarries within the *malgoozaree* villages in the

	Rs.	As.	P.
1837-38, ..	40	0	0
1838-39, ..	7	0	0
1839-40, ..	40	3	0
None since.			

Futtehpore Pergunnah, as well as from those in Surhendee and Furrah, Government seems never to have derived any benefit. The right of allowing stone to be quarried at these mouzahs has always been in the hands of the *zemindars* or village proprietors, within the precincts of whose estates quarries have been formed. The rate of tax and manner of levying it appears to be regulated, as it always has been, according to circumstances, and as suits the convenience of the engagers: in some places, 8 annas a month per quarry is charged; in some, so much for working deserted quarries, and so much for opening new ones; and in others (for instance, at Mouzah Tântpore, in Surhendee), 8 annas a month upon each *khodah* or pick-axe used in the quarry is charged. Such engagements with the zemindars are entered into by the stone-hewer or *sung-tarash*, or, as they are commonly called, *chukera (chukkee* maker,) of whom several families reside in the vicinity of the quarries, and keep the business among themselves, without any limit of time, or defined boundaries. If a quarry be deserted by the original engager, the zemindar has the power to let it to a fresh engager. In former years, the zemindars used to take an equivalent in stone for their own use instead of money; but this is not now adopted. The zemindars are perhaps too poor now to enjoy the luxury of stone houses, as their fathers did: they prefer turning everything into money.

Zemindars' connection with quarries.

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Income to zemindars in Surhendee.

The annual income to the zemindars in Pergunnah Surhendee, calculated on an average of three years, is reckoned at Rs. 200,—*viz.*, Rs. 100 a year in Mouzah Jugnair Bussye, and Rs. 100 in the other three villages. No similar returns are forthcoming for Futtehpore and Furrah.

How long quarries are worked.

Some quarries are worked for 7 or 8 years, others only for one season, according to facility of quarrying, and the quality and quantity of stone dug.

To what depth.

As soon as the diggers reach the moist earth, or the water appears, they cease from digging; the maximum depth is about 20 cubits from the surface; but many quarries are given up long before the diggers go down so far, on account of the heavy expense of lifting up the stone from the quarry; yet it is allowed that the best stone is always found in the lower strata. From this it may be argued, that either the diggers have not energy enough, or their present means of quarrying are insufficient.

Limits of quarries.

There are no assigned limits to a quarry. If two be working conterminous to each other, the space between each is divided by mutual consent. Should they be situated on the lands of two contiguous mouzahs, the intermediate boundary is the line of demarkation for each quarry.

Quarry land how recorded at settlement.

Nothing was recorded at the revised settlement relating to these quarries, excepting that the quantity of land occupied by the hills or rocky eminences where quarries are formed, was exempted from the *malgoozaree* or assessed area, and thrown into *minhâee*,—the wording *arazee-i-koh* (hilly land) being a distinct entry in the *minhâee* lists; for

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instance, in the papers of Pergunnah Futtehpore, the following entries appear under this head:—

		Beegahs.	*Biswas.*
Qusbeh	Futtehpore, 2nd Division, ...	34	4
Ditto	ditto, 3rd Ditto, ...	12	15
Ditto	ditto, 4th Ditto, ...	51	5
Mouzah	Joutanah	413	2
Ditto	Goor-ke-Mundee, ...	83	17
Ditto	Mirzapore, ...	12	8
Ditto	Kurkoul and Tejpore *maâfee* villages.		

Access to river.

The only means of access to the river from the several quarries in this district is land carriage: either carts are employed to convey stone, or, when articles made can be rolled in the fashion of wheels, draught cattle (buffalos chiefly) are used.

Roads.

The roads from the quarries to Agra are heavy and sandy, distressing the cattle, and considerably increasing the expense of transportation. The expense of making an approach from the cart-road to the mouth of the quarry on an eminence, is borne by the party working the quarry.

Pergunnah details.

The following points of information being diverse in their nature in each pergunnah, the peculiarities of each pergunnah are given under the pergunnah head, *viz* :—

Quality of stone.

PERGUNNAH FUTTEHPORE.—The stone produced in the quarries of this pergunnah is considered of inferior quality to that got at the neighbouring quarries within the Bhurtpore territory, at Mouzah Puharpore, &c.; it is chiefly of the description called *lal puthur* (red stone), brittle, not easily smoothened, and soon destroyed by nitre or salt, or the action of the atmosphere and rain. The Tejpore quarries yield a some-

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what better kind, which is dearer than the rest. Very little of the Futtehpore stone is used for building purposes, such as beams, pillars, or architraves, requiring to bear much weight; it is sometimes hewn into squares, for erecting rough walls with, instead of brick, or into cylinders for well bottoms, and other small articles of domestic consumption, which are hardly ever exported.

Articles made.

The only article made for exportation to foreign parts at the Futtehpore quarries, and in which the trade consists, is the *chukkee* or handgrinding-mill. Several thousands are annually made and taken away to Lahore, Umritsur and various towns and marts in the North-Western Provinces, by the carrying merchant, who purchases from the *beoparee* or local trader, he (the local trader) having in the first instance purchased from the *chukera* or stone-mason. The *chukera* from time to time engages with the *beoparee* to supply him with so many *chukkees*, and receives advances of money accordingly. As a certain number are prepared, they are made over at the mouth of the quarry to the *beoparee*. On the arrival of the carrying merchant, he purchases from the *beoparee*, and make his own arrangements for conveying away the *chukkees*; thus, three distinct parties are concerned in this trade—the stone hewer, the local trader, and the carrying or foreign merchant.

Where sent.

Parties engaged in stone trade.

Rates and prices.

The prevailing rate charged by the *chukera* to the *beoparee* is 20 rupees for a hundred *chukkees*, (or 200 separate stones of the requisite circumference and thickness, each mill having an upper and nether stone). At all the Futtehpore quarries, excepting at Tejpore, where, from the better description of stone used, it is 29 rupees per hundred. A further charge

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of 4 rupees a hundred is then made by the *chukeera* for cutting holes in the centre of each stone, to receive the spindle or handle for turning the mill. The common selling price paid by the carrying merchant is from 32 to 40 rupees a hundred. The *beoparee* thus derives a profit of from 7 to 8 rupees on a hundred *chukkees*, or about 30 rupees per cent. on his outlay, to cover interest of money, risk, and gain on trade. The expense of conveyance to the river-side at Agra is from 10 to 12 rupees a hundred on carts, and from 6 to 7 rupees a hundred (about an anna a *chukkee*) if drawn by buffaloes, or bullocks, roller fashion.

The wholesale selling price of *chukkees* at Agra is from 48 to 50 rupees a hundred, or by retail from 8 to 12 annas each, thus giving a remunerative profit of from 3 to 5 rupees on a hundred *chukkees* to the carrying merchant. Quality of stone and weight of *chukkee* influence the selling price very much.

Stone-hewer's remuneration.

The *chukera's* or stone-hewer's remuneration cannot be so clearly ascertained. A head man or contractor for the quarry sometimes employs hired workmen, or he and the members of his family work the quarry and live upon their labour. It is supposed, however, that he gets about 3 annas a *chukkee*. A working man makes about one *chukkee* a day, including quarrying and all.

Modes of conveyance.

Chukkees conveyed in carts fetch a better price than those drawn by cattle, because by the latter mode the stone gets chipped, and is rendered rough and dirty. The process of rolling chukkees by means of draught cattle may be thus described: 8 or 10 stones are placed alongside of each other in a standing position, a piece of rounded wood or pole is passed through the centre holes, to the two ends of which transverse poles or shafts about six feet in-

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length are attached; to these shafts a buffaloe is yoked by means of ropes, and draws the rolling mass behind him.

A chukkee lasts from 3 to 10 years, according to the grinding it receives, and the hardness of the stone. One in daily use is renovated every two or three months, by making the grinding surface rough with a hammer and chisel. When the stones become thin and light by constant chiselling, they are laid aside and a new chukkee purchased. The chukkee is almost an indispensible piece of furniture in native housekeeping. It is met with in the great man's establishment, and seen in the poor man's hut. Every hamlet, cottage containing a family has its chukkee to grind the corn for daily consumption, and if the village bride takes no other dowry to her husband, she must have her chukkee. The woman of a family, whose duty it is to use the chukkee, love it exceedingly. The earliest sounds heard in the morning, in town or village, are those of the chukkee, and it is a certain indication of want of food in the house when the rustic's chukkee is silent; "*chukkee nuhee chultee,*" is a common mode of expression among the poorer classes to denote extreme poverty. Hence the extensive use of stone in chukkee-making.

The chukkee, or handmill —how long it lasts— its general use.

In connexion with the Futtehpore quarries, it may be of use to notice the neighbouring ones in the Bhurtpoor territory, at the villages of Puharpoor and Singowlee. The former village is eight coss from Futtehpore, and the latter about four.

Bhurtpoor contiguous quarries.

The stone quarried at these two places (especially Puharpoor) is of superior quality; it is extensively used in building, and taken to all parts of the country in various forms, both light and heavy. It is commonly divided

Quality of stone.

into two kinds, the *bassee* (white or bamboo colored) and the *lall*, or red stone. The *bassee puthur* is the better sort; it is more durable, bears smoothening better, is easier worked, and is better in appearance than the *lall puthur*.

Rajah's tax.

No quarrying is allowed without permission of the Rajah, and the tax paid to him by parties working the quarries is, at Puharpore: on white stone, 5 rupees 8 annas per 100 mds. on red stone; 4 rupees 8 annas per do.;—at Singowlee, on red stone, 5 rupees per 100 mds.; (no white).

Sungturash's charge.

The charges of the *sungturash*, besides the above Government tax pai dby the purchaser, are, at Puharpore, for white stone, 7 rupees. ½ anna per 100 maunds; for red stone, 5 rupees 8½ annas per do. do.; and 4 annas per 100 mds. for loading stone on carts; at Singowlee, for red stone, 6 rupees per 100 mds.

Trade.

The *sungturash* shapes the stone roughly into the article the purchaser requires (pillars, slabs, blocks, &c.), and places it on carts furnished by the purchaser at the quarry's mouth, and his connexion with it ceases. The expense of transportation is regulated by the distance the stone has to travel, and by its bulk. On very heavy pieces, which require stronger and larger carts, and better cattle, the charge is from 25 to 30 rupees per 100 maunds; from Puharpore to Agra; on lighter materials from 17 to 19.

Measurement of stone to determine weight.

The weight of stone is determined by measurement, thus: 1 *memaree guz* (= 33 inches of an English yard), in length, one-twentieth or 1 *biswa* of the same in width, and the same in thickness = 3 seers of red stone and 4½ seers of grey stone. By this cubic calculation, the measurement of blocks, slabs, &c., is adjusted.

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Uses of stone.

Great quantities of stone from Bhurtpoor are annually taken to Bindrabun and Muttra for the building of Hindoo temples, dwelling houses for the native gentry, ghauts, &c. A good deal is also brought into Agra, and thence, in the way of trade, taken by water to other places up and down the Jumna.

For the removal of very heavy stone, the purchasers sometimes are obliged to make up strong carts or trucks, and hire cattle to draw them.

PERGUNNAH SURHEINDEE.—The quarries in this pergunnah yield both grey and red stone. All the grey is considered of one quality, and goes by the name of *sufaid puthur*; but the red is classified into *taleea* and *ravara*. The following building materials are made at these quarries.

Tham.—Pillars, or posts, circular or square, of sizes.

Putteea.—Flat oblong blocks or slabs used for architraves, lintels, for doorways, cornices, &c., according to thickness and dimensions; common size, 7 feet long, 3½ feet wide, 2 inches thick.

Jad.—Narrow slabs for window shades, balconies and stairs; generally thin, and not more than a foot or 15 inches wide; better cleaned than the puttees.

Chowkah.—Square or oblong flags used for flooring, roofing, &c.; the common dimensions being 5 feet long, 2 wide, and 1 or 1½ inch thick.

The *sungturash's* charge (or he who contracts for the supply to the purchaser) at the quarries, is 7 rupees per 100 maunds for grey stone, and 5 rupees per 100 maunds for red.

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Chowkahs are mostly in demand for Agra, and these are purchased from the hewers on the sopt from 1½ to 2 annas each, or from 2 Rs. to 2 Rs. 8 as. per score. Beoparees or dealers generally contract for them at 10 rupees per 100 maunds, and allow the *putwaree* of the village 1½ anna or so in the rupee for watching their interests. *Chowkahs* sell at Agra from 6-8 to 7 rupees a score, or 45 to 50 rupees per 100 maunds by weight.

The cart hire from these quarries to Agra is from 15 to 18 rupees per 100 maunds. A four-bullock cart conveys about 30 maunds. The selling price of Jugnair stone at Agra commonly is, for heavy articles, from 35 to 40 rupees per 100 maunds. In the rains, when supplies are stopped, it is higher. At Agra, many small articles of domestic use, such as platters, cups, water troughs, &c., are made of the Jugnair stone by the *sungturashes*, and sold in the bazars. Ornamental pillars, trellis work for houses, &c., are also thus made, but none of these articles are ever made at the quarries.

On an average of 3 years, the quantity of stone from pergunnah Surheindee brought into the city of Agra is about 50 thousand maunds a year, and about 6 thousand maunds taken to Muttra.

Many foreign purchasers do not resort to these quarries; the trade seems to be confined to the city of Agra. Carrying merchants take large quantities of slabs from Agra to Dehli by water, and to the Doab and trans-Gangetic provinces of Rohilcund by carts.

PERGUNNAH FURRAH.—The red stone is alone found in the quarries within this pergunnah. The articles made from it, and chiefly for local use (*i. e.* in the district) consist of the *chukkee*, or hand-mill; the *koloo*, or oil and sugar mill; the *khandeh* or *ent*, or squares used for bricks, for wells, walls, &c.

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But the *chukkee* is the principal article made. The *sungturash* or chukkerás charge at the quarry's mouth is 20 rupees per 100, as in Futtehpore. He sells at 25 or 26 rupees per 100. Oil or sugar mills are from 12 to 15 rupees each: *ent*, or squares, at 8 annas a hundred in tale.

The distance from Dhanowlee to Gow ghât on the Jumna (10 miles west of Agra) is 5 coss; from Nimmiah 7 coss.

Chukkees are commonly rolled to this ghât by buffaloes or bullocks as above described; all other articles are conveyed in carts. The selling prices at Gow ghât are, for *chukkees*,—33 rupees per hundred; for *koloos*,—18 to 20 rupees each; for *khandeh*,—5 rupees per hundred.

Chukkees from the Nimmiah quarrics are about 2 rupees per 100 higher than those of Dhanowlee, on account of the greater distance from the ghât than Dhanowlee.

P. B. REID,
Deputy Collector.

Agra, 17*th November*, 1846.

REPORT BY W. E. MONEY, ESQUIRE, COLLECTOR OF ZILLAH MIRZAPORE, UPON THE STONE QUARRIES IN THAT DISTRICT.

No. 211.

From W. E. MONEY, ESQUIRE, *Collector of Mirzapore, to* E. P. SMITH, ESQUIRE, *Commissioner of Revenue, 5th Division, Ghazeepore.*

SIR,—With reference to the instructions contained in the Minute by the Lieutenant-Governor, North-Western Provinces, dated 30th January, and received with your letter No. 52 of 9th March, relating to the stone *mehals* of this district, I have the honour to submit the following information, which I trust will answer the desired purpose.

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2. With the view of exhibiting the amount of revenue derived by Government from the stone mehals, I have the honour to subjoin a statement of the yearly amount realized since the separation of this district from that of Benares, under the operation of the duties established by Regulation II. of 1800.

DATE.	JUMMA REALIZED.		
	Rs.	A.	P.
From Nov., 1830, to Apr., 1831, Kham Tehseel, ...	22,131	6	2 *
" May, 1831, to Apr., 1832, ditto, ...	29,823	0	1 *
" May, 1832, to Apr., 1833, ditto, ...	33,587	15	4 *
" May, 1833, to Apr., 1834, ditto, ...	19,372	1	0 *
" May, 1834, to 14th Mar., 1835, ditto, ...	17,800	9	4 *
" 15th Mar., 1835, to 15th do., 1866, Rugber Dial, &c., farmers, ...	32,001	0	0
" 16th ditto, 1836, to 15th ditto, 1837, ditto, ...	32,001	0	0
" 16th ditto, 1837, to 15th ditto, 1838, ditto, ...	32,001	0	0
" 16th ditto, 1838, to 15th ditto, 1839, ditto, ...	32,001	0	0
" 16th ditto, 1839, to 15th ditto, 1840, Kham, ...	24,146	10	6
" 16th ditto, 1840, to 15th ditto, 1841, Mr. Menzis farmer,...	28,500	0	0
" 16th ditto, 1841, to 15th ditto, 1842, ditto, ...	28,500	0	0
" 16th ditto, 1842, to 15th ditto, 1843, ditto, ...	28,500	0	0
" 16th ditto, 1843, to 15th ditto, 1844, Prag Dutt Doobey, &c., supoordars, ...	28,500	0	0
" 16th ditto, 1844, to 15th ditto, 1845, ditto, ...	28,500	0	0
" 16th ditto, 1845, to 15th ditto, 1846, ditto, &c., farmers.	29,500	0	0

3. For the first four years, the mehals were held under *kham* management, and the duties collected by Government servants, as prescribed by the above Regulation; but in March, 1835, they were leased out to farmers, and with the exception of one year—*viz.* 1839-40,—the same plan has been followed up to the present time.

4. There can be no doubt that for many years subsequent to the promulgation of Regulation II. of 1800, such was the demand for stone from these mehals, that no difficulty was experienced in levying the prescribed duties in the usual legitimate manner; but of late years, the demand from other quarters has so much decreased, that the far-

* Cost of establishment amounted to 152 rupees a month.

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mers to enable themselves to pay their jumma and realize a small profit, have to depend entirely on the monopoly afforded them by their lease, and act precisely in the manner described in the 5th, 6th, and 7th paragraphs of the Lieutenant-Governor's minute.

5. The decrease has no doubt been caused by the existence of duty-free quarries in other parts of the country; and that any demand at all should exist under such heavy prohibitory duties as obtained in these mehals, can only be attributed to the vicinity of the quarries to so many populous cities, where a certain supply must always be kept up.

6. The prohibitory nature of the duties now levied are particularly felt in the Chunar Division, where, under the operation of Regulation II. of 1800, the duties are considerably higher than in Mirzapore. In the latter division, cut stone *of all sizes* pays an uniform duty of 2 annas and 6 pie per cubic foot, while in the former the charge for small stones only is 2 annas and 8 pie per cubic foot. If a stone measures 4 cubic feet, the duty is 4 annas; and for all measuring 5 feet and upwards, the duties are no less than 5 annas per foot.

7. The reason assigned for the difference is, that the stone of Chunar is of a finer quality and texture than that of Mirzapore, and also that the quarries being nearer the river, heavy stones can be transported at a less cost, and are therefore better able to bear an increased rate of duty; but the effect has been, that, excepting for expensive and ornamental works, where price is no object, no one will take stones from Chunar at a duty of 5 annas per foot, in preference to those of Mirzapore at half the cost.

8. The present farmers, who have taken a five years' lease, from March, 1845, are four stone merchants of some

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capital, who share the profits and loss in equal proportions, and do not appear to be connected with any other parties. They modify the Government duty considerably to the merchants, who keep on terms with them; and with those who do not, the enforcement of the letter of Regulation II. of 1800 is sufficient to prevent opposition.

9. By the regulation, the duties upon stone are leviable before they are removed from the quarry, but the *beoparee* who is already under advance to his *mahajun*, and cannot realize the price of the stone till it is sold and delivered, has not the means of paying, and is therefore constrained to keep on terms with the farmer, who, by the enforcement of the regulation, can put a stop to his trade altogether.

10. It is this power which enables the farmer to create an almost exclusive monopoly of his own, which he effects to the full extent of his means. He constrains the *beoparees* to sell him stone at the *kutcha* rates as far as he has the means of purchasing, and only allows them to remove what he himself is unable to take.

11. In return for their compliance, he allows the stone to be taken to the different *chowkees* on the banks of the river, where they are prepared for export; and the duties, which to friendly parties are much modified, are not levied till the stones are sold and removed.

12. The amount of duty remitted is not the same in all cases, but the usual extent is from 10 to 12 per cent. on common stone. On *kolhoos* or sugar-mills it is from 15 to 17 per cent. The latter are quarried throughout the year, but only exported in the rains, at which time the duties are paid; were they levied at the quarry, as the regulation authorizes, the trade in this description of stone would be stopped altogether.

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13. European stonecutters, and large capitalists who deal in stone of an expensive kind, are not included in the above compromise, but pay the full duties authorized by the regulation. They, however, find it to their interest to keep on terms with the farmers, and by this means enjoy the privilege of not paying duty till the stone is removed from their working yards.

14. The only way to put an end to this monopoly, provided the farming system is continued, would be to lease out the mehal in small portions to different parties, each portion to comprise a certain number of *mouzahs* compactly sittuated, with the limits of each *ilaqah* properly defined.

15. This would destroy the power of the present monopolists, and greatly benefit the trade, as the competition between the different small farmers would cause them to reduce their profits to the lowest possible standard.

16. It was formerly customary, when a *beoparee* wanted to open a new quarry, for him to present a *durkhast* to that effect to the Collector, who gave him written authority to do so; but this custom has long been in disuse, and he now selects his own locality, without consulting any one save the mahajun, who advances him the money to begin.

17. The selection of a piece of ground for a new quarry is a matter of great importance, and attended with much uncertainty. Sometimes a good situation is found near the surface, which can be worked with great profit and facility, whilst in other places the expense and difficulty of removing the superincumbent strata before good stone is reached, causes the whole work to be abandoned with considerable loss.

18. If the stratum turns out a good one, the *beoparee* has no difficulty in clearing his advance, and working his

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quarry with considerable profit, but his means do not allow him to go to any considerable depth, and when he has exhausted all the stone that can easiest be got at, he usually seeks for a new locality. The depth of the quarries varies from 8 to 25 feet, according to the value of the stone, and the means of those who work it.

19. Although the quarry is deserted for a new one, and may be unoccupied for a succession of years, the *beoparee* still retains a right of property over it; and if a larger capitalist, with means of working to a greater depth, wishes to re-open the quarry, he cannot do so without first purchasing the rights of the original proprietor.

20. To show at a glance the injurious nature of the present excessive rate of duties on the stone trade, I beg leave to subjoin a statement of the cost and charges upon a description of stone in common use, by which it will be observed, that the duties are 25 per cent. greater than all the other expenses put together.

Cost of 2 *bhotes*, each measuring 6 feet long, 2 feet broad and 3 inches thick.

	Rs.	As.	P.
Stone-cutter's remuneration, ...	0	4	0
Hackery hire, ...	0	8	0
Government duty, 2½ annas per cubic foot,	0	15	0
	1	11	0

21. The duty for the same stone in Chunar is Re. 1, and yet they are sold with difficulty at Re. 1-12, and sometimes for less, when a good reduction of duty can be obtained from the farmer.

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22. I subjoin a list of several small articles not enumerated in Regulation II. of 1800, on which a separate rate of duty has been fixed for the whole mehal. These articles, most of which are in considerable demand, do not appear to be included in the compromise alluded to in paragraphs 9, 10, 11, and 12, of this report, but it is not unusual for the farmer to sub-let the duties on some of them for a fixed amount, leaving the sub-farmer, who thus becomes a monopolist of the article specified to make his own collections and arrangements.

NAME.	DUTY.			
	Rs.	As.	P.	
Mulookee or Koondee,	0	14		Per hundred.
Punjeebbeeah, ...	1	12	0	ditto.
Thureeah, ...	2	10	0	ditto.
Kutorah, small, ...	1	12	0	ditto.
Chowkah, 1st quality,...	2	8	0	ditto.
Ditto, 2nd ditto, ...	1	12	0	ditto.
Kutorah, large, ...	3	8	0	ditto.
Ditto, middling, ...	1	5	0	ditto.
Chundrowtah, ...	0	14	0	ditto.
Hoorsah, ...	0	7	0	ditto.

23. In compliance with the instructions conveyed in the 15th paragraph of the Lieutenant-Governor's Minute, I have the honour to forward a register of 283 quarries at present open, and of 894 closed, according to the form prescribed. They are situated in 63 mehals, comprising 75 mouzahs, paying a Government revenue of Rs. 70,645 per annum, but the zemindars are precluded by Regulation II. of 1800 from exercising any control over them. * * *

I have the honour to be, &c.,

W. E MONEY,

Collector.

Mirzapore Collectorship,

The 22nd September, 1846.

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Extract of a Report from E. H. C. MONCKTON, ESQ., *Officiating Deputy Collector of Allahabad, No. 373, dated 2nd April, 1846.*

4. The stone quarriers state, that there are ten or twelve quarries in Mouzah Purtabpore, Pergunnah Barra, of which only two are worked by merchants. The Tehseeldar states four as the total number worked. There is no cart road, but only one fit for foot-passengers. The distance is variously stated at from 25 jurreebs to half a koss from the Jumna, to which the stone is carried by men, who make it their livelihood. The stones are not weighed at the pit, but sets of eight, twelve, and sixteen men are employed *teekah* to carry sets of four, according to their estimated weight, to the river. Thus, if they are small, eight men carry them; if a size larger, twelve; and if still larger, sixteen. One stone only is carried at a time from the pit to the river, and put on board the boat. The largest stone known to have been dug of late years was in the Banda Zillah; it weighed 45 maunds, was 10 feet long, and 1 foot and a half square, and required sixty-four men to carry it. The heaviest stones raised here weigh 14 maunds.

5. There are three sorts of stones found in the Allahabad district, two of which find their way to market in a manufactured form. The former are termed *golabee* and *sufeid*—the latter *dhoka*, which is used in the lump as foundations for walls. The two former are used indiscriminately for *khumbas, puttees, burgas, hoorsas, hoolsees, mehras, lohars, sils, koondees, panchoras, sung farashes* and *kolhoos*. The white stone is alone used for *chukkees, jantas*, and *khurruls*, as being of a harder nature; no stone is sold in the neighbourhood of the quarry or river, but is brought to Allahabad, which is the only mart for it; at present, it is therefore impossible to compare the relative value with that quarried at Mirzapore.

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6. The terms *janta, chukkee, hoorsa, selee, dhooka, puttea, kolhoo,* and *khumba,* mentioned in Section 82, Regulation XXII. of 1795, appear to correspond with those in use in the market here, while *chowka, dassa, awbboet, boojowtee, nul, buddrow, khonth,* either seem local terms proper to Mirzapore, or else constitute articles not in the market here. The head workman in the quarry receives Rs. 9; the rest from Rs. 6 to Rs. 8 per month.

7. The price in the Allahabad market is as follows:—At Bulloa Ghât, 100 maunds of either sort is landed in the unwrought mass at Rs. 20: thus, it costs Rs. 16 to cut, carry, and load it on board the boats at Purtabpore on the Jumna, Rs. 3 boat-hire to Bullooa Ghât at Allahabad, and Re. 1 for landing it; making in all Rs. 20: and is sold in the market at from Rs. 22 to Rs. 25 the 100 maunds. The *dhoka* is sold at Rs. 5 or less the 100 maunds; its sole use is for the foundations of buildings, and is found to be cheaper than bricks for this purpose. *Khumbas,* from 3 to 7 feet in length, and 6 inches to 1 foot square, sell for from Rs. 22 to Rs. 25 the 100 maunds, and are landed for Rs. 20. *Bundga* or *burga,* from 1½ to 4 feet in length, and from 10 inches to 1 foot in breadth, and 2 inches thick, sell for Rs. 3-8 the 100 square feet. Of puttees for roofing or paving rooms, from 4 to 10 feet long, 16 to 18 inches broad, and 3 to 5 inches thick, the price is from Rs. 22 to Rs. 25 per 100 maunds. Of *mehrah,* used for paving court-yards, or for cornices or supports at the top of *khumbas,* from 4 to 6 feet long, 2½ to 3 feet broad, and 3 to 5 inches thick, the price is from Rs. 22 to Rs. 25 per 100 maunds.

Chukkee—ready for use, Re. 1.

Janta—ditto, 12 annas.

Hoorsa—used by Hindoos for preparing and rolling their bread on a wooden roller, from 1 anna 9 pie, to 2 annas 3 pie.

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Hoolsee—a small circular stone for pounding.

Chundun—used for *tilluk*, half an anna.

Lohra—the muller for rubbing on the *sil*, from 10 to 12 inches long, 1 anna.

Sil—from 8 inches to 2 feet long, from 1 anna to 4 annas.

Sung furash—or weights for keeping down carpets or placing against doors, are sold in sets of 4, from Re. 1½ to Rs. 2 the set.

Khoondee—or stone saucer, from 3 to 5 inches in diameter, from 1 anna 9 pie to 2 annas.

Khurul—or pestle and mortar, from 6 inches to 13 inches in length, from 8 annas to 1 rupee.

Punchora—or stones for supporting legs of charpoys and made to hold water, 4 of which are sold in a set, varying from 6 inches to a foot in diameter, at from Re. 1 to Rs. 2-4 the set.

The fort of Allahabad and other old buildings in the city bear testimony to the durable and excellent qualities of the *sufeid* and *golabee* stone for building. One sort, called *dhoosur*, is decidedly bad for these purposes, and is speedily destroyed by salt, as would appear from the rapid destruction taking place in the magnificent *baolee* attached to Sultan Khoosroo's garden.

9. The only places that seem ever to have been supplied from these quarries beyond their immediate neighbourhood for agricultural purposes (as *chukkees*, *kolhoos*, &c.), are Lucknow, Cawnpore, Humeerpore, and Allahabad.* *Khum-*

* The quarries at Purtabpore have been closed for the last 6 months, owing to the great depth the stone is found at; and the merchants procure their supplies from the Bundelkund district, about 2 miles further off; whence it is procured at the same cost, but with this difference, that here they have to make advances for quarrying with the risk of its turning out bad, whereas there they get it good without trouble, and ready quarried.

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bas, &c., were sent to Cawnpore and Humeerpore for the use of Government only, when the buildings in cantonments were being constructed; those sent to Lucknow were of great size, and required for some bridge. Since then, the only place which has been supplied from these mehals is Allahabad.

10. No competition, notwithstanding the duty, can take place with Mirzapore, for several reasons. The first is, that the stone of that place is better, to the extent of Rs. 5 in every hundred maunds. The Mirzapore stone is found good at the surface, whereas at Purtabpore it is found good only at an average depth of 25 feet. The earth is first dug out to the depth of from 12 to 14 feet; the bad hard stone called *dhoka* is then blown away with gunpowder, till the *golabee* and *sufeid* make their appearance; and, after all, it is a matter of chance and good luck if it turns out of a good quality and fit to be worked. The boat-hire from Purtabpore to Allahabad is Rs. 3, whereas from Mirzapore to Allahabad it is from Rs. 10 to Rs. 16 the 100 maunds,—which difference would prevent the Mirzapore stone from finding a market at Allahabad; whereas the Mirzapore stone being of better quality, and found on the spot, at a cheap rate, notwithstanding the duty, would prevent the stone of this district being sent there or anywhere below it. The quarriers assert, that if the duty at Mirzapore were removed, and that they were to quarry at Mirzapore, they could not bring 100 maunds to Allahabad at a less rate than Rs. 30 without profit, whereas they sell their own stone now at from Rs. 22 to Rs. 25 the 100 maunds, taking a profit of from Rs. 2 to Rs. 5. Cawnpore is apparently more or less supplied from Mirzapore; in this way, the quality of stone being superior, and the articles of consumption small and few, they are placed on empty return boats, and are found to be more profitable, even though brought a greater distance, than the inferior stone of Allahabad.

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Burgas, however, are sent to Cawnpore *viâ* Allahabad, from Banda, at a cost of Rs. 12 per hundred.

11. Having answered all the queries contained in the above letter regarding the stone mehals in Pergunnah Barra, and it being evident from the Minute of the Hon'ble the Lieutenant-Governor regarding those in Mirzapore, that all the information possible on this subject should be collected, I have deemed it my duty to make enquiries regarding the stone found in other pergunnahs of this zillah, and beg to subjoin what I have been able to ascertain on the subject.

12. Stone is found in several villages immediately on the banks of the Jumna, in Pergunnah Atherbun, and in Pergunnahs Arail and Khyragurh, at distances varying from 1½ to 15 koss from the Ganges.

13. The zemindars do not seem to exercise any right in the mehals in these pergunnahs, and the Government, either former or present, have not done so. The country people dig out the stone as they require it. It is mostly of inferior quality, and is not worked by the stone merchants. If any good pieces are found, they are made into *chukkees* and *jantas,* and sold in the neighbourhood. The only approximation to an exercise of right of possession seems to have been when Lieutenant Sharp, about seven years back, blew up and carried away some stone from Mouzah Teekur, Pergunnah Arail, when Mussumat Oleea Begum complained to Mr. Montgomery, who referred her to the Civil Court; but it does not appear that she thought it worth while to go there : however, Lieutenant Sharp paid Rs. 4 for every 100 maunds he removed. It is supposed, that though the stone at present found in this pergunnah is not good, yet by digging deep a better quality would be found. The stone in Mouzahs Payagpore, Ramgurwa, and Rajapore, Pergunnah Khyragurh, is reported the best in that pergun-

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nah, and at the same time nearest the Ganges, to which a good cart road-leads.

14. The names given by the people to the different sorts are as follows:—in Pergunnah Khyragurh, *doodheea, bullooa,* and *kukura.* The *doodheea* is found pretty good after digging through five yards of bad stone; the *bullooa* is of bad quality, and is used chiefly for walls in the lump; the *kukura* is also pretty good, and is found three yards deep, of tolerable quality. The *doodheea* and *kukura* are made into *chukkees* and *jantas.* In Pergunnah Arail, *doodheea, teleea, dhoosur,* and *choorba.* These, according to their quality, are made into *chukkees* and *jantas.* In Pergunnah Atherbun, *doodheea, mutteea, burooah,* and a sort of stone with red streaks without any particular name—not used. If any good stones are found, they are made into *chukkees* and *jantas.* The stone is reported as inferior, and not generally fit for building purposes.

15. Though there are no means of ascertaining the exact value of stone at the quarry, as none is sold there, I have endeavoured to ascertain the cost of digging it, which is as follows: eight men can dig 100 maunds of stone, of all sizes up to 10 maunds in weight, at a cost of about Rs. 10; if the pieces are of larger size—say 20 maunds each—taking 5 stones to the 100 maunds, the cost will be about Rs. 16; if large, the same rates, (*i. e.,* Rs. 16 to the 100 maunds) still hold good. Eight men carry four stones weighing about 4 maunds each, *i. e.,* 16 maunds in all, to the river, and place them on board the boats, at a cost of Re. 1—which would make about Rs. 6 for every 100 maunds. If the four stones weighed 6 maunds each, it would require twelve men, at a cost of Re. 1-8, or about the same price; *i. e.,* Rs. 6 per 100 maunds, and so on, in proportion to the size.

The very small lumps are carried by coolies on their heads, at a cost of about 2 annas for 16 maunds.

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Burgas are carried on bullocks, at a fixed price of Re. 1-12 per 100 pieces.

E. H. C. MONCKTON,
Officiating Deputy Collector.

Extract from a Report of H. ROSE, ESQUIRE, *Collector of Banda, No. 191, dated 27th May, 1846.*

2. I have the honour to forward a register (marked A.) of the stone quarries in this district, prepared according to the form recommended in the Minute of the Lieutenant-Governor; I forward also a similar register (marked B.) regarding the iron mines.

3. The quarries in Banda are on the same footing as those in Allahabad and Agra, "where the quarries are left entirely to the zemindars, the Government asserting no claim to the stones, and levying no duty upon them."

4. I have forwarded to your address by dâk banghy specimens of the different stones produced in the district, with numbers corresponding to those in the register. Two specimens of white stone common in this district are forwarded; these are not numbered nor entered in the register, because that species of stone is not turned to any use.

5. I forward also a species of lime-stone which is found in the village of Kootla, in the foreign territory on the border of this district, and from which lime, said to be of very superior quality, is made, in the village of Goorampore, Pergunnah Budowssa. The Settlement Officer alluded to this circumstance in page 52 of his Settlement Report, where he says: "at Goorampore, in Budowssa, lime is

"manufactured to a large extent, and is exported to all the "large stations and to Lucknow."

6. The Rajah of Patur Kutchar, to whom the village of Kootla belongs, charges for the stone one pice per maund, and pays to the zemindars of Goorampore two *dumrees* per maund, for the right of way through their estate.

7. The stone is converted into lime on the area of Goorampore, and the manufacturers pay to the zemindars of Goorampore from 4 annas to 10 annas per kiln, according to its size. The lime is sold on the spot to *beoparees*, who export it to different parts of the country. Four maunds of the best lime at Goorampore are bought for Re. 1.

H. ROSE,
Collector.

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APPENDIX A.

Register of Stone Quarries in the District of Banda.

1.	2.	3.	4.	5.	6.	7.	8.	9.
Number in List.	Name of Mouzah.	Number of Quarries in the Mouzah.	Name of Owner.	Time that the Quarry has been worked.	Quality of stone.	Quantity or value of stone raised in preceding year.	Terms of agreement with the farmer.	Remarks.
				Pergunnah Budowssa.				
1	Raolee.	1 quarry.	Zemindars of the Mouzah.	From time immemorial.	*Doonga* and *bunsee*. The first is the best quality.	Value said to average less than Rs. 200 per annum.	The proprietors of the village levy Re. 1-4 per annum from each man who works in the quarry.	Mills and grinding-stones, &c., are made from the stone called *doonga*, and flags are hewn out of the stone called *bunsee*.
2	Goonda.	1 ditto.	Ditto.	Ditto.	Ditto.	Rs. 100.	Ditto.	The same as No. 1.
3	Sidapore.	3 quarries.	Busawun and others, zemindars of the Mouzah.	Since twenty years.	*Burooa*, grey colour.	" 15.	The proprietors of the Mouzah levy Rs. 2 per annum from each man who works in the quarries.	Flags, pillars, and ornamental arches, &c., of buildings, are made from the stones raised from these quarries.

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				PERGUNNAH TIROHAN.				
4	Mundyan Bunwaree.	2 quarries.	Nir Bhyram and others, zemindars of the Mouzah.	Previous to the accession of the British Government.	*Doodheea*, red colour.	Rs. 50.	...	Various sorts of vessels are made from this stone. The *chumar* inhabitants of the village quarry, and the zemindars charge them nothing.
5	Bhounree.	1 quarry.	Buhoree Shew Ghulam and others, zemindars of the Mouzah.	Since 3 years.	Ditto ditto.	Rs. 50.	...	The proprietors used to levy Rs. 2, per annum from each individual who worked in the quarry. The quarry is not worked at present; stone of the same kind as No. 4.
6	Koolgudhya.	1 ditto.	Bhoop Singh and others, zemindars of the Mouzah.	Since 15 years.	*Burooa*, grey colour.	"	"	Ditto ditto ditto. The same as No. 3.
7	Buryaree Kulan.	3 quarries.	Ram Ruttun and others, zemindars of the Mouzah.	Since 20 years.	*Musua* and *Lal*.	Not known.	The proprietors levy Rs. 4-4 per annum from every person who works in the two quarries on the level ground, and Rs. 2 from those who work the quarry on the hill.	There are 3 quarries in this village, two in the plains and one on a hill. The red stone (*lal*) is produced in the quarries on the plain, and the white stone (*musua*) is hewn from the quarry on the hill.

1.	2.	3.	4.	5.	6.	7.	8.	9.
Number in List.	Name of Mouzah.	Number of Quarries in the Mouzah.	Name of Owner.	Time that the Quarry has been worked.	Quality of stone.	Quantity or value of stone raised in preceding year.	Terms of agreement with the farmer.	Remarks.
				PERGUNNAH CHIBOO.				
6	Purdawan.	5 quarries.	Nund Lall and Bhowanee, zemindars of the Mouzah.	Since 10 years.	*Lal.*	Rs. 49.	These quarries were let in farm last year for Rs. 49.	There are 4 quarries at present. Flags are made from the stone raised from these quarries. They are let this year for Rs. 56, there being a slight difference in the quality of this stone and *lal*, No. 7.
8	Mutteepoor, Malee.	1 quarry.	Bhugwant, zemindar of the Mouzah.	Since 12 years.	*Lal Buroha.*	It was not worked last year.	The proprietors levy Rs. 4 per annum from every person who works in the quarry.	The stones raised from this quarry are used as substitutes for bricks, in constructing walls of buildings.

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APPENDIX B.

Register of Iron Mines in the District of Banda.

				PERGUNNAH TIROHAN.				
1	Deoreo, maâfee.	1 iron mine, & 7 *bhuttees* or forges.	Girdharee Dass, mâafeedar of the Mouzah.	Since 7 years.	Iron ore.	Not known.	The maâfeedar levies a duty of Rs. 4 per annum for every furnace worked in the village.	The iron made in this village is annually exported to the districts beyond the Ganges.
2	Rujboani.	1 iron mine, & 42 *bhuttees* or forges.	Gunga Pershad and Ram Pershad, zemindars of the Mouzah.	Previous to the accession of the British Govt.	Ditto.	Ditto.	The proprietors of the village levy a duty of Rs. 5 per annum for every furnace in the village.	Ditto ditto.
3	Goburhye.	1 iron mine, and 17 *bhuttees* or forges.	Doorga, zemindar of the Mouzah.	Ditto.	Ditto.	Ditto.	Ditto. Ditto.	Ditto. Ditto.
4	Nihee.	1 iron mine, and 10 *bhuttees* or forges.	Bhowanee Deen and others, zemindars of the Mouzah.	Ditto.	Ditto.	Ditto.	The proprietors levy a duty of Rs. 6 per annum for every furnace worked in the village.	Ditto ditto.

H. ROSE,
Collector.

Zillah Banda, the 27th May, 1847.

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3.

DESCRIPTION OF THE SPECIMENS OF STONE COMMON IN AGRA, ALLAHABAD, BANDA, AND MIRZAPORE.

By J. Middleton, Esq., F. G. S.

On receiving the orders of Government to examine and report upon the capabilities of the stone used, or supposed fit, for building in these Provinces, it became necessary for me to consider what properties are most suited to ensure durability in stone, or the converse. The question has been often discussed by others; and though with reference to sandstone, the order which I have chiefly to examine, I have no authorities within reach, I am in no doubt about the general conclusions arrived at. In addition to this, I felt desirous of adding such information as might be interesting or useful in a scientific point of view. Amongst the qualities that are most essential to the durability of sandstone, exposed to atmospheric influence, are to be ranked compactness and uniformity of structural arrangement and strength of molecular constitution. Amongst the properties which have an opposite tendency, may be ranked the presence of peroxide of iron—the red colouring water of our sandstones. Wherever such stone is used, the evil influence of this substance soon manifests itself, producing disintegration of the surface of the stone. In the Agra College, during the rains—for it is then that the destructive activity of iron is most conspicuous—pinches and handfuls of red, almost impalpable, powder, are constantly falling from the roof. The palace in the Fort at Agra, especially the eastern front, affords striking evidence of the same destructive influence, the ornamental tracery being there almost entirely obliterated. Similar defacement is likewise observable on the elaborately decorated buildings at Futtehpore Sikree; and, what is still more lamentable, that singularly

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beautiful and unique structure, the Kootub Minar at Delhi, begins to manifest similar symptoms of incipient disease. Around the inner margins of the upper galleries, where rain-water lodges, exfoliation has begun, and scales of the stone may be stripped off and pulverized between the finger and thumb; a ribbon of some cement impermeable to water, might serve to retard the process of decay.

Another cause of decay in stones is ready absorption of water, which, when imbibed, by constantly expanding and contracting, through influence of temperature, tends to unsettle or overthrow the molecular arrangement of the stones. In general, this element of destruction seems to co-operate with that considered in the last paragraph, so far at least as disintegration of surface goes.

In order to test the qualities of stones in the respects just adverted to, it became necessary to analyze them, or representatives of groups of them, accurately; and they being mostly silicious, a steel mortar became indispensable. With this I have been unable to provide myself, Native and European workmen, though undertaking it in turn, having alike failed in making one; and as the report on the quarries will wait for me no longer, this notice appears deficient in at least one important respect.

In ascertaining the absorbing capacity of the stone, the specimens operated upon, which were mostly small, as will be seen from the weighings, were all steeped at some distance under water for 48 hours. The period seemed, as proved by experiments performed with that view, to be sufficient for saturation. In the computations, the water displaced in grains troy is taken as the unit.

There is always considerable doubt attached to results from experiments performed to test the cohesive force of stones, *i. e.*, resistance of stones to crushing pressure; and

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although by care that the specimens operated upon were exactly of the same size and condition, and faithful representatives of the rock, also that the applications of the crushing force were always in the same direction with reference to the plane of stratification, such doubt might be minimized, yet the same care in placing the stones in the building could not be carried out, and the practical bearing of the experiments is therefore but small. It may be safely admitted, moreover, that, with reference to the stones now under notice, if they fail, it will not be through defect of power to resist pressure; and I have not on these grounds thought it necessary to expose the specimens to tests of this nature.

I have divided and arranged the rocks in series, according to the localities in which they are found. The tabular statements give the results of experiments, and the preparatory observations are descriptive of the appearances, &c., of the stone.

The arrangement by which large masses of stone are moved from place to place, is represented in the plate annexed to this note. It was sent to me by Mr. E. H. C. Monckton, from Allahabad, together with a description given below;* and as I have myself seen it employed elsewhere, can bear witness to its efficiency.

* As the facility with which large masses of stone are moved without mechanical aid in these and other quarries may not be generally known, and as the method adopted may aid in forming a solution of the difficulty in accounting for the construction of the pyramids and other ancient buildings, I have much pleasure in subjoining it. A large stone is fastened securely on each side to two long and strong poles or beams, which extend a considerable distance in advance and behind it; on these are again bound cross-pieces, and on these other short cross-pieces, to which the bearers apply their shoulders as in carrying a palkee. The poles are prolonged by additional ones being tied on, and the cross-pieces extend according to the weight of the stone. If very weighty, in addition to the poles length-ways, others are placed across it with thin cross-pieces, which can also be extended to any amount proportionate to the weight; so that there is no stone of whatever weight used in building that could not be carried along any distance without any other apparatus being necessary than an extension of the cross-pieces; and, if thus once raised, that could not in like manner be carried up an inclined plane, and deposited as they are in the pyramids, &c. It is computed that on an average the apparatus weighs half as much as the stone itself.

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I have not taken the weights, directly, of the large specimens sent me, as no useful comparison could, without expense and waste of time, be made of the results; the specimens being, with the exception of the Agra and Bhurtpore ones, of different sizes, and though intended to be cubes, yet being far from accurately so. There is, however, sufficient data in the tables for computing the weights, bearing in mind that a cubic inch of water at 4° centegrade weighs 252·962 grains, and that the density of water at 4°: density at 30°*: : 1 : ·99,599. The computations have been made, and appear in the tables.

It is proper to observe, that information derived from facts calculated to give direction to my enquiries and completeness to their results was almost totally wanting to me. It is usual in Europe, when stones of good quality are required for the erection of expensive buildings, as lately, in the case of the British Houses of Parliament, first to seek out proof of durability as afforded by existing ones, and then to determine the constitution of the material of which they are composed. This mode of proceeding is obviously necessary to give immediate practical value to such enquiries. If, however, the following results be in so far defective, they, it is to be hoped, still have a value independent of this, and will moreover be ready for practical application when such may be necessary.

ALLAHABAD ROCKS.

Arail Series.—No. 1. "*Doodheea*" of the miners, and marked in my specimens as "4th sort," is a coarse crystalline quartzose sandstone.

No. 2. "*Chooreea,* 1st sort." Belongs to the same class as No. 1, is more compact, and is of a faint pinkish tinge.

* The temperature of my experiments.

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No. 3. "*Teeleea*,, 2nd sort." A coarser rock than No. 2, and finer than No. 1, belonging to the same class. It has a slightly crenulated appearance, probably due to the earthy and uncrystallized portions being washed out by percolation of water. There are distinct marks of stratification in this rock; its colour is deeper and more earthy than that of No. 2; and it looks as if somewhat brittle.

No. 4. "*Dhoosur*, 3rd sort." This rock belongs to the same class as the former rocks; it is, however, of much finer grain than either of them, and has a peculiarly soft and subdued buff tinge, which would look very well in a building. There is evidence, however, of minute patches saturated with iron being existent in it; and if they be so to any extent, they constitute a disease which will diminish its value as a building-stone.

Khyragurh Series.—No. 1. "*Doodheea*, 1st quality." A quartzose rock, very compact, and of agreeable colour.

No. 2. "*Dhoodheea*, 2nd quality." This rock is of the same order, and similar to the preceding, but of coarser grain.

No. 3. "*Bullooah*, 2nd sort." This rock is of much the same character in respect of structure as No. 4 of the Arail Series: in it, too, there are symptoms of incipient disease through presence of iron. It has a slight yellow tinge also.

No. 4. "*Bullooah*, 1st quality." This rock is well crystallized, and very compact on the whole. It is, however, pitted here and there by portions of uncrystallized earthy matter, which prevents it from taking on a smooth surface. It would probably be durable, and look well as a building material.

No. 5. "*Doodheea*, 3rd quality." Closely resembling No. 1 of this series.

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No. 6. "*Kukera.*" This rock is of corresponding character, though inferior to No. 2 of this series.

No. 7. "*Bullooah*, 2nd quality." Corresponds in structure with No. 3. It wants, however, its yellowish tinge; and, so far as my specimen informs me, it is free from the patches of peroxide of iron remarked in that rock. It has a bluish tinge, which is wanting in the other.

No. 8. "*Doodheea*, 1st quality." This is the most compact and handsome rock of this series; but as, in the specimen, it was marked the same as another specimen far inferior to it was, *viz.*, "*Bullooah*, 2nd sort," it must be left to the general report to assign to it its proper place. It approaches in appearance to No. 2 of this series, but is more compact, and with, at the same time, distinct marks of stratification.

Bara Series.—No. 1. A compact semi-crystaline sandstone of a dull reddish tinge, freckled with minute black spots. It is marked in my specimen "*Doodheea* No. 3."

No. 2. "*Sufeid*, 1st sort." Sandstone, with distinct laminar shades, the general effect being a rose colour. Why it should be called "*sufeid*" it is difficult to conjecture, unless on the supposition that there has been some mistake in the marking of the specimen. It would make a handsome building-stone. It is somewhat less compact than No. 1.

No. 3. "*Goolabee*, 2nd sort." Like No. 2, but less compact and deeper in colour in the small specimen, indicating the presence of a greater proportion of iron. The larger specimen, however, differs from this, being almost white. I presume, therefore, from the name, that the smaller specimen represents the rock.

Atherbun Series.—No. 1. "*Doodheea*, 1st sort." A compact semi-crystalline sandstone, of an agreeable light colour,

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with laminar markings in the small, but none in the large specimen.

No. 2. "*Muttee Bullooah*, 1st sort." Like the last in general structure, it is of coarser grain, and looks somewhat brittle.

Table of Weights, &c.

No. of specimen.	Weight of the specimen dry, in grains.	Weight in water.	Mass of the specimen in grains of distilled water.	Weight when saturated with water.	Specific gravity.	Weight of an inch cube in grains.	Absorbing power—the mass of the specimen being 1.
			ALLAHABAD ROCKS.				
			Arail Series.				
1	530·5	302	228·5	550	2·32	584·93	·085
2	646	369	277	659·5	2·33	587·58	·049
3	743·5	441	293·5	743·5	2·50	630·51	·031
4	525	309	216	536·5	2·63	612·36	·053
			Khyragurh Series;				
1	866·5	500	366·5	891·5	2·36	595·67	·068
2	693·5	399·5	294	716·5	2·36	594·30	·078
3	877·5	508	369·5	897	2·37	598·33	·058
4	837	489	348	846	2·40	605·99	·026
5	787·5	454·5	333	812	2·36	595·82	·074
6	716	419·5	296·5	782	2·41	608·41	·057
7	659·5	381·5	278	625·5	2·37	597·71	·057
8	875	506·5	368·5	899·5	2·37	598·24	·064
			Bara Series.				
1	727	427·5	299·5	748·5	2·42	611·56	·072
2	986·5	588	398·5	1,010	2·48	623·71	·059
3	902·5	539·5	363	924	2·49	626·41	·059
			Atherbun Series.				
1	1,060	628	432	1,082·5	2·45	618·21	·052
2	1,066·5	623·5	443	1,092·5	2·41	606·56	·059

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*Banda Series.**—No. 1. "Mouzah Purdanwan." Sandstone, compact and slightly micaceous, colour, dullish red.

No. 2. "Mouzah Maheepore Burroha." Much the same as the last, colour more earthy, and not micaceous.

No. 3. "Mouzah Rowlee, 2nd sort." Structure like the preceding; colour more lively.

No. 4. "Mouzah Buryaree, 2nd sort." A micaceous sandstone, of a purplish tinge in the large specimen, but whitish in the small one: the specimens are probably from different rocks.

No. 5. "Mouzah Purdanwan." Resembling No. 2.

No. 6. "Mouzah Mundyan Doodheea." A dull red micaceous sandstone, stratified.

No. 7. "Mouzah Buryaree Kulan." Closely resembling No. 1, but of deeper colour.

No. 8. Mouzah Girampore." Limestone, unfit for building purposes by reason of its incompactness, but more fitted by its purity to make excellent lime.

No. 9. A red coloured sandstone, tending to crystallization.

Besides the above specimens, one of clay iron-stone was forwarded to me, which, on analysis, gives 82 per cent. of peroxide of iron. The product is not, however, likely to be of first-rate quality, as the usual proportion of manganese is wanting. The ore has a strong earthy smell, and looks slaggy, as if it had been exposed to great heat.

* With exception of Nos. 2, 3, 9, and 10, the small specimens of this series agree with the large ones in name only.

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Table of Weights, &c.

No. of specimen.	Weight of the specimen dry in grains.	Weight in water.	Mass of the specimen in grains of distilled water.	Weight when saturated with water.	Specific gravity.	Weight of an inch cube in grains.	Absorbing power—the mass of the specimen being 1.
1	682	404·5	277·5	704·5	2·46	619·21	·081
2	1,119	651·5	467·5	1,159·5	2·39	603·06	·087
3	923·5	530	393·5	964	2·35	591·29	·103
4	827	479·5	347·5	857·5	2·38	599·59	·088
5	1,206·5	716	490·5	1,238	2·46	619·72	·064
6	1,375·5	826	555·5	1,409·5	2·48	623·86	·061
7	1,038·5	608	430·5	1073	2·41	607·79	·081
8	987	591·5	395·5	1,011·5	2·50	628·76	·024
9	804	467·5	336·5	829	2·39	601·98	·031

Mirzapore Series.— 1. "Mine of Rawurjara." A compact sandstone, slightly micaceous.

No. 2. "Mine Rodraj Putwaree." A sandstone of finer grain than No. 1, but reddened by presence of iron. These specimens show a tendency to crystallization; No. 1 more distinctly than No. 2.

No. 3. "Mine of Bhowaneepore." A bluish coloured sandstone, distinctly crystalline.

No. 4. A granular sandstone, of rather coarser grain, and somewhat brittle.

No. 5. "Bhooreepooree Mine." A semi-crystalline sandstone; colour, bluish grey.

No. 6. "Potpurria Mine." A sandstone of very fine grain, compact, with laminar markings; colour, a rich buff.

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No. 7. "Dooreea Koke Mine." A compact quartzose rock of a bluish colour, with minute black specks of what appears to be hornblende. It is also slightly iron-shot.

No. 8. "Soanke Teree Mine." Limestone of magnesian constitution, the proportions not determined. This limestone is exceedingly compact, though somewhat earthy, and coloured deep black by iron, with probably organic matter. It breaks with difficulty, and shows no difference of weight when strongly dried in a sand-bath, and after two days immersion in water. It would doubtless be found a very durable stone for architectural purposes; but it is disqualified by its colour, on which latter account I have not thought it necessary to enter into a minute analysis of it.

No. 9. "Rodraj Putwaree." A compact sandstone, of a light and lively red colour. Of this and the two following specimens, I had but small portions sent me, and they do not therefore appear in the table.

No. 10. "Potpurria." A red rose coloured sandstone, enriched by fine and distinct laminar markings.

No. 11. "Tereea." A whitish and coarse crystalline sandstone.

Table of Weights, &c.

No. of specimen.	Weight of the specimen dry, in grains.	Weight in water.	Mass of the specimen in grains of distilled water.	Weight when saturated with water.	Specific gravity.	Weight of an inch cube in grains.	Absorbing power—the mass of the specimen being 1.
1	559·5	334	625·13	567·5	2·48	225·5	·014
2	376·5	226	630·29	388	2·50	150·5	·031
3	663·5	392·5	616·85	674·5	2·45	271	·016
4	997·5	601·5	634·64	1012·5	2·52	396	·015
5	652	389	624·60	660	2·48	263	·012
6	690·5	417·5	637·27	701	2·53	273	·016
7	882·5	536·5	642·63	889·5	2·55	346	·007
8	1069·5	675·5	682·83	1069·5	2·71	394	·000

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Agra and Bhurtpore Series.—No. 1. "Bunsee Beharpore Bhurtpore." A semi-crystalline sandstone, of a light flesh colour, with indistinct markings of stratification.

No. 2. "Roopbass Bhurtpore." A singularly beautiful granular sandstone, of fine grain, and clouded cream colour, with minute sparkling points of mica.

No. 3. "Agra Mouzah Joonaneh." A liver coloured sandstone, somewhat relieved by minute yellow circular specks and fine laminar markings. The stône is nearly of as fine grain, but is less compact in structure, than No. 2. This specimen is so perfectly identical in appearance with No. 5, that it is difficult to believe them other than products of the same quarry.

No. 4. "Bhurtpore Roopbass." Similar to No. 3, but wanting in the yellow specks.

No. 5. "Bhurtpore Bunsee Beharpore." *Vide* No. 3.

No. 6. "Agra Tajpore." A granular sandstone of fine grain, handsomely striped with cream colour and light red, and dotted like No. 3.

No. 7. "Bhurtpore Roopbass." A harsh semi-crystalline sandstone; colours, liver and soiled yellow, irregularly disposed.

Table of Weights.

No. of specimen.	Weight of the specimen dry, in grains.	Weight in water.	Mass of the specimen in grains of distilled water.	Weight when saturated with water.	Specific gravity.	Weight of an inch cube in grains.	Absorbing power—the mass of the specimen being 1.
1	836	483·5	352·5	855	2·37	597·53	·023
2	822·5	469	353·5	847·5	2·33	586·22	·030
3	890	511	379	909·5	2·35	591·65	·027
4	764·5	441·5	323	786·5	2·37	596·33	·021
5	828·5	474·5	354	854	2·34	589·66	·031
6	835·5	479·5	356	858	2·35	591·30	·028
7	1128·5	646·5	482	1151·5	2·34	589·88	·020

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Kootub Minar.—It may be interesting, and also useful in respect of reference, to introduce here a description, corresponding with those given above, of the stone forming the crust of the Kootub Minar at Delhi. This building, being probably about 6 enturies old, gives satisfactory evidence of the durability of the material of which it is composed. I have had no specimens of the Delhi rocks sent me, and hence there is no report on them. The fragment which is here examined, and which I know to be genuine, belongs to my own private collection. There is no doubt, I think, but that the body of the pillar is made up of the strong quartz rock found abundantly in the neighbourhood, and which, from its compactness and highly crystalline character, shielded as it is, moreover, from direct atmospheric influence, will remain undeteriorated till the outer shell has been reduced to dust.

Kooub Minar."—A sandstone of fine and equal grain, very much resembling in this respect the Roopbass stone. It is liver coloured, with numerous, chiefly round, cream coloured spots, proceeding from the section of spheroidal masses of that colour.

Table of Weights, &c.

Weight dry in grains.	Weight in water.	Mass in grains of distilled water.	Weight when saturated with water.	Specific gravity.	Weight of an inch cube in grains.	Absorbing power.
1,891	1,076	815	1,946	2·32	585·8	·067

J. MIDDLETON.

Agra, the 19*th June,* 1847.

SUICIDE IN BUNDELKUND.

No. 1.

SUICIDE IN BUNDELKUND.

I.—*Extract, Paragraphs 12 and 13 of a Letter from the Secretary to the Government of the North-Western Provinces, to the Commissioner of the Allahabad Division, No. 2240, dated the 18th July, 1840.*

12th.—During the period under review, no less than 53 cases of suicide are stated to have occurred, besides 15 attempts. Where the instances are, as in this case, so deplorably numerous, it would be satisfactory if the statement was accompanied by an assurance that the real circumstances of each case had been ascertained, and some explanation of the probable causes which produced so lamentable a result.

II.—*Extract, Paragraph 2 of a Letter from the Joint Magistrate of Calpee, to the Commissioner of Circuit, 4th or Allahabad Division, No. 123, dated the 18th May, 1841.*

2nd.—The suicides for the year amount to 12. They appear to be all *bonâ fide* such, and were all effected by immersion in wells. Mr. Raikes directed that all wells in villages should be so covered over, as to render them less easy of access to persons bent on self-destruction. This measure might be attended with a partial success; but it is doubtful how far it is popular with the zemindars, who are the only instruments by whom its adoption can be generally effected. It is with the utmost difficulty that they can be made to exert themselves at all in the matter.

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III.—*Extract, paragraph 113 of a Letter from the Commissioner of the Allahabad Division, to the Secretary to Government, North-Western Provinces, Judicial Department, Agra, No. 39A., dated the 25th May, 1841.*

113th.—Of the cases included under this head, there are no less than 30 instances of self-destruction, besides 15 unsuccessful attempts. Of the 45 persons concerned, 34 were females and 11 males. The means chiefly resorted to by these deluded objects were those of drowning. Five of the number hung themselves, two shot themselves, one cut open her skull with a stone, and the remainder threw themselves into wells. Every case was carefully investigated by the Magistrate, and the supposed cause of each casualty is explained in the 12th and 13th paragraphs of the Magistrate's report.

Suicide.

IV.—*Extract, Paras. 8 and 9 of a Letter from the Magistrate of Humeerpore, to the Commissioner of the 4th or Allahabad Division, No. 31, dated the 16th February, 1842.*

Para. 8th.—With reference to the 12th paragraph of the Government Order dated 18th July, 1840, on the Police Report for 1839, received with your Letter No. 35 of the 14th August, 1840, I have the honour to state, that I have gone through the proceedings in all the cases of suicide and attempts at the same.

Para. 9th.—During the past year, 47 fatal, and 27 attempted cases of self-destruction have occurred; total, 74 persons: of whom 50 were females and 24 males. The assigned causes are—severe bodily suffering, arising from various diseases;—poverty; family and other quarrels; jealousy; and idiocy; and the means adopted were as follows:—

One man and one woman hung themselves, two women and one man cut their throats, two men poisoned themselves, and the rest threw themselves into wells.

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V.—Extract, paras. 70 and 71 of a Letter from the Commissioner of Circuit, 4th Division, Allahabad, to the Secretary to Government, North-Western Provinces, Agra, No. 19A., dated the 24th March, 1842.

Para. 70th.—It is lamentable to find no less than 46 cases of suicide within the year, and 28 unsuccessful attempts; making an aggregate of 74 cases.

Para. 71st.—The Magistrate states that he has gone through the proceedings in each case, and it is therefore presumable that self-destruction has been satisfactorily established.

VI.—Extract, para. 30 of a Letter from the Secretary to Government, North-Western Provinces, Agra, to the Commissioner of the Allahabad Division, No. 1061, dated the 7th June, 1842.

Para. 30th.—The number of suicides, as reported in the 70th paragraph of your letter, is indeed most extraordinary, and the Lieutenant-Governor could have wished to have been told, whether, in your opinion, this circumstance is to be taken as indicative of great distress prevailing in the district. The return of the permanent Magistrate, Mr. Taunton, will, His Honor trusts, cause an improvement in the administration of the police in this district.

VII.—Extract from the Police Report of the Allahabad Division for 1844, No. 18A., dated the 8th April, 1845.

CAWNPORE DISTRICT.—*Suicide.*—*Para. 16th.* There were 17 cases of suicide during the year, nine of which are ascribed to disputes and quarrels; the remainder to grief, poverty, anger, and bodily suffering. There are 19 cases in which attempts were made, which are accounted for from similar causes.

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FUTTEHPORE DISTRICT.—*Suicide.—Para. 43rd.* During the period under review, there were ten cases of suicide which terminated fatally, besides five unsuccessful attempts. Of the ten fatal cases, four were males and six females; they all originated in quarrels, disease, or distress, with exception to the case of a female, who caused herself to be blown into the Ganges by gunpowder, by the direction of her *gooroo.*

HUMEERPORE DISTRICT.—*Suicide.—Para. 69th.* During the past year there were 36 cases of self-destruction, and 18 unsuccessful attempts, making a total of 54, being a decrease, when compared with the year preceding, of eight fatal and twelve attempted cases.

Para. 70th.—The crime of suicide is an offence against society, inasmuch as it is believed that many are influenced through the force of example; and, in this view of the case, I think Magistrates would exercise a sound discretion by punishing every attempt under the general regulations as a misdemeanor. The same causes which lead to the crime in the Humeerpore district, are prevalent in every other; yet in no district is it so common as in Humeerpore.

BANDA DISTRICT.—*Suicide.—Para. 93rd.* There are 12 cases of suicide which proved fatal, and five unsuccessful attempts. A detail of these cases is submitted.

ALLAHABAD DISTRICT.—*Suicide.—Para. 121st.*—The total number of suicides which were committed within the year amounts to 19, of which nine were males and ten females.

Extract from the Orders of Government on the Police Report of the Allahabad Division for 1844, No. 2080, dated the 16th May, 1845.

Para. 10th.—The number of suicides in this and the other districts under your charge has already been observed. With reference to your suggestion, that the attempt to commit this crime should be punished as a misdemeanor,

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it is thought that if the natural fear of death will not deter from the attempt, no minor punishment is likely to be efficacious. The Magistrate, it is observed, has repeated the opinion expressed by him last year, that a Dispensary would be of use in checking the evil. You are already aware that Government do not anticipate that such a measure would be productive of much advantage in this respect.

VIII.—*Extracts of a Letter from the Officiating Magistrate of Humeerpore, to the Commissioner of the Allahabad Division, No. 51, dated the 5th March, 1846.*

Para. 8th.—With reference to the 12th paragraph of the Orders of Government dated the 18th July, 1840, received with your Letter No. 35 of the 14th August of the same year, the following statement will exhibit the required information regarding suicides effected and attempted :—

Assigned Causes.	Falling into Wells.		Hanging.		Shooting.		Total.
	Men.	*Women.*	*Men*	*Women.*	*Men.*	*Women.*	
Suicide.							
Bodily suffering, arising from various kinds of diseases, ...	4	6	2	1	2	0	15
Leprosy, ...	0	2	0	0	0	0	2
Shame, ...	0	1	0	0	0	0	1
Grief, ...	0	1	0	0	0	0	1
Idiocy, ...							
Family and other quar-	6	7	0	1	0	0	14
rels, ...	2	6	1	1	0	0	10
Total, ...	12	23	3	3	2	0	43
Attempts at Suicide.							
Bodily suffering, arising from various kinds of diseases, ...	1	4	0	0	0	0	5
Family and other quarrels, ...	6	1	0	1	0	0	8
Idiocy. ...	1	0	0	0	0	0	1
Total, ...	8	5	0	1	0	0	14

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IX.—*Extract from the Police Report of the Allahabad Division for 1845, No. 19 A., dated the 31st March, 1846.*

HUMEERPORE DISTRICT.—*Suicide.—Para. 52nd.*—There are no less than 57 cases under the head of suicide—43 of which proved fatal. During the year preceding, there were only 36 fatal cases and 18 attempts; total, 54.

ALLAHABAD DISTRICT.—*Suicide.—Para. 102nd.*—There are 23 cases, all of which proved fatal.

Extract from the Orders of Government on the Police Report of the Allahabad Division for 1845, No. 2194, dated the 23rd May, 1846.

HUMEERPORE AND CALPEE.—*Para. 5th.*—The continued prevalence of suicide in this part of the country remains still unaccounted for. The fact can hardly be doubted, after inspection of the detailed statement furnished by the Magistrate in paragraph 8 of his report.

X.—*Extract from the Police Report of the Allahabad Division for 1846, No. 16, dated the 25th March, 1847.*

HUMEERPORE DISTRICT.—*Suicide.—Para. 73rd.*—The return under this head exhibits a decrease of seven cases which terminated fatally, while the unsuccessful attempts exactly correspond with those of the year preceding; namely, 14.

1845, ... 43
1846, ... 36

BANDA DISTRICT.—*Suicide.—Para. 92nd.*—Under this head there are 25 cases, of which 17 terminated fatally.

ALLAHABAD DISTRICT.—*Suicide.—Para. 116th.*—There were 20 cases,—males and females in equal proportions.

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XI.—*Extract from the Police Report of the Allahabad Division for 1847, No. 41, dated the 26th April, 1848.*

BANDA DISTRICT.—*Suicide.—Para. 98th.*—There are only 15 cases entered in the statement, against 25 of the preceding year. Of the 15 cases, three did not terminate fatally.

ALLAHABAD DISTRICT.—*Suicide.—Para. 128th.*—The number of deaths from self-destruction during the year amounted to 20; *viz.*, 12 females and 8 males.

XII.—*Extract from the Police Report of the Allahabad Division for 1848, No. 40, dated the 15th June, 1849.*

HUMEERPORE DISTRICT.—*Suicide.—Para. 83rd.*—Life was destroyed in 49 instances, being 19 cases in excess of the preceding year. There were also 12 cases in which the parties failed in the attempt.

ALLAHABAD DISTRICT.—*Suicide.—Para. 137th.* During the period under review, there were 30 instances of self-destruction; *viz.*, 9 males and 21 females.

Extract from the Orders of Government on the Police Report of the Allahabad Division for 1848, No. 3935, dated the 30th November, 1849.

BANDA DISTRICT.—*Suicide.—Para. 12th.*—The entire absence of suicides in the Banda district, as compared with the considerable number (61, including attempts) in the adjoining district of Humeerpore, is remarkable and suspicious.

XIII.—*Extract from a Letter from the Officiating Magistrate of Banda, No. 8, dated the 19th February, 1850.*

Para. 10th.—Adverting to the extract from the Orders of Government dated the 30th November, 1849, No. 3935, relative to the entire absence of suicides in this dis-

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trict during the year 1848, I beg to state that there were reported in that year, by the police, 19 suicides and attempts. The attempts were included in heading 42, Statement No. I; but suicides have never been brought forward in the Statements since December, 1844, when orders were received from the Sudder Court, No. 1898, dated 23rd November, 1844, directing that the practice of accounting suicides a criminal offence should be abandoned. During the year 1849, 12 suicides and attempts were reported.

XIV.—*Extract from the Police Report of the Allahabad Division for 1849, No. 32, dated the 18th May, 1850.*

HUMEERPORE DISTRICT.—*Suicide.—Para. 103rd.* There were 39 cases which proved fatal, and 13 attempts; the note in the margin will show the difference between the last two years.

Suicides,	1848,...49 :	attempts	12.
„	1849,...39 :	„	13.

BANDA DISTRICT.—*Suicide.—Para. 128th.* It was stated in my report of the past year, that not a single case of suicide was brought to notice. The Magistrate observes, with reference to this subject, that 19 cases, including attempts, had been reported from the thannahs, but that as regards the actual commission of the crime, he had been interdicted from accounting for it as a criminal offence. Agreeably to orders from the Court of Nizamut Adawlut, dated the 23rd November, 1844, suicides cannot of course be dealt with on the person* as a criminal offence, because the party who commits the crime places himself beyond the pale of justice; but it appears to me to be a strange anomaly, that while actual casualties are not to be entered in the statements, attempts to commit the crime are included, as if the attempts were fraught with worse evils than the

*By the law of England, the felon's property is forfeited to the Queen.

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actual completion of the crime. If the mere attempt be not a punishable offence, why is it accounted for at all? In England, attempts at suicide are punishable as a criminal offence, because it is a public wrong; in this country, there is no express law; but if it were made punishable under the general regulations, it might operate as a check upon the crime.

ALLAHABAD DISTRICT.—*Suicide.—Para. 179th.* There are 31 cases recorded, which closely correspond with the return of the past year, which was 30.

Extract from the Orders of Government on the Police Report of the Allahabad Division for 1849, dated the 8th July, 1850.

Para. 129.—Clause 7th.—The Lieutenant-Governor is not aware on what grounds the orders of the Nizamut Adawlut, mentioned in paragraph 10th of the Officiating Magistrate's letter, were issued. He apprehends, however, that there must be some misconception, since suicides are entered in the Criminal Statements of other districts, as is evident from the returns now under consideration. A reference from yourself to the Court would probably clear up the point.

XV.—*From R. Spankie, Esq., Officiating Magistrate of Cawnpore, and late Officiating Magistrate of Humeerpore, to W. Muir, Esq., Secretary to Government, North-Western Provinces, dated 30th January, 1855.*

I have the honour to submit a demi-official report on the prevalence of suicide in the district of Humeerpore, lately called for.

2nd.—The delay in submitting this report has arisen from various causes, but chiefly from a desire on my part to obtain comparative tables from neighbouring districts,

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in which, I regret to say, I have been unsuccessful. The records of suicides have been destroyed at Banda; and from Jaloun I have not as yet been favoured with an answer to my communication.

3rd.—On receiving your instruction, I put myself in correspondence with Mr. Freeling, the Officiating Joint Magistrate of Humeerpore, for I had not the means at hand of ascertaining the number of cases which had occurred of late years.

4th.—I particularly directed Mr. Freeling's attention to the following points:—1*st*, the number of cases which had occurred; 2*nd*, the part of the country in which the greater number occurred; 3*rd*, the class of people chiefly affected; 4*th*, the exciting causes; and 5*th*, the mode of investigation into all reported cases of suicide.

5th.—Mr. Freeling has carried out my instructions with considerable care, and has exhibited great interest on the subject; but with all his endeavours to meet Mr. Colvin's wishes, if the tables now submitted are not sufficiently clear or comprehensive, the fault must be attributed to the scanty nature of the records.

6th.—First, then, as to the number of cases which have occurred. We have taken a period of ten years, inclusive, from 1844 to 1854. During this period the total number of ascertained suicides amounts to—

	Males.	Females.	Total.
Suicides, ...	69	188	257
Attempts at suicides, ...	40	50	90

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7*th.*—The following is the area and population of the district of Humeerpore by the last census:—

DISTRICT.	AREA.	POPULATION.		TOTAL.
	S. Miles.	*Males.*	*Females.*	
Humeerpore, ...	2241·6	2,93,578	2,55,026	5,48,604

8*th.*—I have failed to obtain, as stated above, tables from adjoining districts on the left bank of the Jumna; therefore am compelled to use the records of this office. The following is the area and population of the Cawnpore district:—

DISTRICT.	AREA.	POPULATION.		TOTAL.
	S. Miles.	*Males.*	*Females.*	
Cawnpore, ...	2348·0	6,22,093	5,52,463	11,74,556

9*th.*—I have taken a period of five years inclusive, and the number of cases which have been reported in Cawnpore, from 1849 to 1853, are as follow:—

	SUICIDES.			ATTEMPTS.		
	Males.	*Females.*	*Total.*	*Males.*	*Females.*	*Total.*
1849, ...	3	5	8	0	0	0
1850, ...	2	4	6	0	0	0
1851, ...	3	4	7	2	0	2
1852, ...	1	3	4	1	0	1
1853, ...	1	2	3	4	1	5
Total, ...	10	18	28	7	1	8

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10*th.*—You will now observe, on looking at Table No. 1, and comparing it with one above given, that inclusive of suicides and attempts, nearly as many cases occur in one year in the district of Humeerpore, as occur in a period of five years in that of Cawnpore.

11*th.*—As to the pergunnahs chiefly affected, these would appear to be Rath and Punwaree. The proportions from 1844 to 1854, inclusive, are as follow :—

	Suicides.		Attempts.		
	Males.	*Females.*	*Males.*	*Females.*	*Total.*
Rath, ...	15	57	14	15	101
Punwaree, ...	20	86	13	25	144
					245

12*th.*—These pergunnahs are the largest, and in parts of them, to the south, the large and open wells and *baolies*, which are to be met with near every village and road, offer a ready means of death. Mr. Freeling records that, during the period under review, 82 cases of death were from drowning—74 occurring in wells, and 8 in tanks. At the same time, whilst admitting that these wells and tanks may offer the means of a ready death, I would observe that their presence does not necessarily induce the desire for it; and we must look for a solution of the prevalence of suicide in these pergunnahs to some other cause than the presence of wells and sheets of water; and this brings me to the third part of the subject, *viz.*, the class chiefly addicted to suicide.

13*th.*—Mr. Freeling has compiled a Return, No. 2, showing the castes of the persons who destroyed themselves

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from 1851 to 1854, both inclusive, a quarter of 1854 being omitted, as not expired when the details were made up. From this it will be seen, that the castes principally adopting this mode of death, are Brahmins and Lodhas:—

	Males.	*Females.*	*Total.*
Brahmins, ...	4	13	17
Lodhas, ...	2	15	17
	6	28	34

And the women of every caste in the Return, with the exception of that of Dhobee, more or less, are the more numerous victims; their number being 48 to 16 men, or as 3 to 1.

14*th.*—We come now to the exciting cause. Mr. Freeling has also prepared a table to illustrate this part of the subject, as far as he could ascertain from the records—the cause which led to the fatal act.

15*th.*—I was surprised to find so few cases attributable to abuse, anger, grief, and insanity; and it is also to be observed, that not a single case of suicide, from amongst the Brahmin and Lodha, is set down to "shame." But their women, especially the latter, are hard-worked in the district of Humeerpore, and more accustomed to mix generally with the men in out-door pursuits, and accordingly we find that they suffer most from sickness, as the following table of suicides, from that cause, will show:—

	Males.	*Females.*	*Total.*
Brahmins, ...	2	10	12
Lodhas, ...	2	11	13
	4	21	25

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16*th*.—Mr. Freeling has entered into details regarding several of the existing causes, such as anger, grief, shame, and sickness, to which I would refer you.

17*th*.—It is the last-mentioned existing cause which, I think, should engage most attention. The larger number of cases are attributed to gripes, dysentery, rheumatism, and ague. These attacks of gripes are represented to be sudden, and painful beyond conception. At the same time I had not heard of the disease before as peculiar to Bundelkund, nor have I ever heard it alluded to by doctors as having come under their observation; whilst in Humeerpoor or Banda, it is strange, also, that the women should be so affected in such great disproportion; and stranger still, that the women of the Brahmin and Lodha castes should be the greatest sufferers.

18*th*.—I am inclined to believe that the women suffer greatly in Bundelkund from over-work, at all times. The people are poor, and their wives and daughters have to work hard from an early age. It is well known that the Lodha women are compelled to labour continuously in the fields, and so large are the areas of many estates, that they have frequently to labour at very great distances from their homes. We see no less than 13 cases of self-destruction amongst these women in 3½ years, and 12 cases amongst the agricultural Brahmins, who also work in the fields. I particularly enquired, when at Humeerpore for a day or two, regarding the cases of Brahmins, whether they were widows, and I found that in most of the cases the husbands were alive and in their villages. I believe, therefore, that child-bearing, and the necessity for commencing work too soon after it, poverty, long and continuous labour, and exposure, sooner or later bring on these women, certain sickness, which incapacitates them from giving further aid to their families. Their position,

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then, is anything but desirable; they are useless to their families, and their life becomes insupportable to themselves. The country contains, I believe, no hakeems (there is one at Chirkaree, a servant of the Rajah); and the dispensary at Humeerpore is too far off their homes, and no one can be spared to attend the sufferers there. They get worse and worse in their villages, until they seek for release from their misery in the grave. The table of age, which is embodied in Mr. Freeling's report, would seem to bear out my views. As far as that officer could ascertain, the ages of 51 victims were as follow :—

Ages.	*Females.*
20 years and under, ...	17
20 to 30, ...	14
30 to 40, ...	9
40 to 50, ...	11
Total, ...	51

19*th*.—The castes amongst the men, from which the greater number destroyed themselves, are found from 1851 to June, 1854 :—

Brahmins, ...	4
Chumars, ...	3
Mussulmans, ...	4
Total, ...	11

In these cases we find that the exciting cause is attributable as follows:—

	Abuse.	*Shame.*	*Sickness.*	*Total.*
Brahmins, ...	1	1	2	4
Chumars, ...	0	0	3	3
	Insanity.			
Mussulmans, ...	1	0	3	4
Total, ...	1 + 1	1 +	8 =	11

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So it would appear also from these figures, that of the male suicides, exactly half are caused (including, the one case of insanity) by sickness.

20*th*.—As Mr. Freeling has described the mode of investigation in these cases, I need not go over the same ground. I would only refer to the fact, that suspicious cases are sent back to the local police for further investigation; but that out of 98 cases, from 1851 to June, 1854, in two cases only was there any apprehension of foul play, and in four cases there were doubts as to whether death had been the result of accident or self-design.

21*st*.—In conclusion, the results of our investigation show—1st, that there is a prevalence of suicide in Humeerpore; 2nd, that the women are the chief victims; 3*rd*, that of these women, the Brahmins and Lodhas are the principal sufferers; 4*th*, that nearly two-thirds of the cases occurring in 3½ years are ascertained to have been superinduced by sickness; and 5*th*, the fact, whatever may be the cause, that in a period of 3½ years, after deducting the cases of sickness, as many persons committed suicide in the district of Humeerpore, as in the district of Cawnpore, twice as populous, in a period of five years. For the last fact I cannot account, but if the Cawnpore returns are correct, which I believe them to be, I think that it will be admitted that sickness has had a great deal to do with the prevalence of suicide in Humeerpore; and if we can alleviate that, the custom perhaps may wear out of itself, or become less by degrees.

22*nd*.—The subject having now been brought before His Honor, I have only to leave it for his consideration. But since this enquiry undoubtedly shows that so large a proportion of the suicides are to be attributed to "sickness," I would venture to suggest, that the Civil Surgeon should be directed, in the next cold season, to visit the Rath and

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Punwaree Pergunnahs expecially, and ascertain, as far as he can, the nature of the sickness which goads persons to self-destruction. Having ascertained certain facts, he might be further directed to distribute the medicines necessary for relief, and to supply the same at the thannahs and police chowkees.

23rd.—You are well aware of the position of Humeerpore as it bears upon the district, and especially on those pergunnahs in which suicide is most prevalent. It is a long way for the sick to come for treatment; and, as I stated above, an agricultural family cannot, without loss, detach any of its members with the sufferers. Though liberally supported, the dispensary at Humeerpore does little good beyond its own immediate neighbourhood. I would also recommend that the propriety of opening a dispensary in the populous town of Rath should engage attention. The Government, no doubt, are prepared to supply the medicines: a part of the Nuzzool funds might be directed to its first establishment. And the local influence of the Collector and Tehseeldar might obtain a few subscribers, sufficient to keep it in existence, from amongst the numerous surrounding zemindars.

XVI.—*Memorandum by* MR. G. H. FREELING, *Officiating Joint Magistrate of Humeerpore, on the Prevalence of Suicide in Zillah Humeerpore, No. 221, dated 16th February, 1855.*

On calling for the *misls* of all suicides from 1844, it appears from the record-keeper's report, that those up to 1845 were destroyed by order of the Nizamut Adawlut, and to the end of 1850 by order of the Commissioner—a list of such cases being preserved. This list is very defective, in many cases, in the particulars of caste, age, and exciting causes; but the results obtainable will be found, with those of subsequent years, below.

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The points to which my attention was particularly directed were—1*st*, the numbers and extent of the cases; 2*nd*, the pergunnahs in which they principally occurred; 3*rd*, the class of people affected; 4*th*, the exciting causes; and 5*th*, the mode of investigation: and the following tables will give an answer to the four first heads. In respect to the last, the practice seems to have been uniform, the principal difference consisting in whether the Deputy Magistrates of the pergunnahs interfered in the investigation or not. Immediately on a report of any suicide reaching the thannah, the naib darogah himself, his mohurrir, or a jemadar who can read and write, proceeds to the spot, summons the zemindars and principal inhabitants of the village to the inquest, and after taking a minute description of the appearances on the corpse, any injuries, &c., makes an enquiry into the causes and manner of death, and takes the deposition (not on oath) of witnesses. These being certified to by the jury, are forwarded, with the description and opinion of the thannahdar, to the Sudder Station, where the Magistrate either files in the office, or, if any suspicious circumstances appear, remands the case for further investigation. Latterly, however, in most pergunnahs, especially those of Punwaree, Rath, Modha, and Sumeerpore, the papers first go to the Officer of Police and Deputy Magistrate of the pergunnah, to look over and repair any omission, and then certify to the ordinary forms having been observed, and the opinion of the thannahdar, probably correct, by his signature. In very few cases, however, do any suspicious cases appear; so that in 1851 two cases, in 1852 but one, also in 1853, were tried before the Magistrate himself; and respectively, three, four, and three, and in 1854, up to June, four *misls*, returned to the local officers for further investigation.

From the papers examined, it seems that since 1851 to June, 1854, out of the entire number of 98 who accomplished

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their self-destruction, in two cases only was there any serious apprehension or doubt of foul play—one in 1851, the other in 1852; but no proofs were forthcoming; and in four cases, at least, there is great doubt whether the death of the parties was not the result of accident, and not a voluntary act.

Table No. I. shows the number of suicides and attempts which were reported since 1844, arranged by their thannahs, those bracketed together being of the same pergunnah, the first-named giving the pergunnah name also. The excess of one thannah over another is difficult to explain, and indeed in itself varies according to different years. Rath, however, is decidedly the largest and most populous thannah in the district; and Jelalpore, although perhaps next in extent, is very thinly peopled. Modha is the only thannah whose lands have any considerable number of Mussulmans in it. Sumeerpore and Jelalpore, with Guhrowlee, are generally Thakoor; and Rath and Punwaree Pergunnahs abound in Lodhas, though also having a large Rajpoot population. The numbers of victims of different castes, since 1851, appear in Table No. II.

Table No. III. gives the causes which led to self-destruction, and I have classed them under seven heads. The first and third are much of the same nature, on account of quarrels in the one case with neighbours, and in the other with relations, the latter often arising from supposed or proved infidelity. "Anger" numbers but three, which all happened by way of *dhurna*;" in one case from a boy being impressed, against his mother's will, by a zemindar to do some work, and in the other two from the parties not receiving the alms they solicited. "Grief," in four cases of females, occurred through reluctance of the young girls to leave their mother's roof, on being required to do so by their husbands; and the one male, an *Aheer*, destroyed himself through sorrow at the death of his only grand-daughter. "Shame" was the cause in several cases, chiefly in

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consequence of infidelity being discovered, or at a false accusation of it. One woman, a Bussorea, of 60 years of age, threw herself down a well, in consequence of being violated; and a *sonarin*, of 24, at being examined by midwives to see if she was pregnant. "Sickness," however, is the alleged reason in by far the larger number of cases, and "gripes" the most frequent species: the others being rheumatism or ague, flatulency, stone, epilepsy, and two cases of venereal,—leprosy appearing in five or six cases.

The means of death are not so various, 13 having hung themselves, 1 man stabbed himself, and no less than 74 thrown themselves into wells, and 8 into tanks, while 2 took poison,—in the one case opium, in the other *sunkheea*. Of the attempts since 1851, 5 chose the halter, 1 poison (opium), and 1 the sword; all the rest, amounting to 30, throwing themselves down wells. The prevalence of this mode of death may be accounted for by the large number of deserted wells in the southern part of the district, and the existence of so many *baolies*, which are too large to be covered in by any woodwork. The zemindars have also the greatest objection to be made to fence their wells in, and notwithstanding the repeated orders to that effect, more than half the wells in the district, many of them level with the ground, gape open, without any defence. The respective ages, as far as can be ascertained, or were recorded, were:—

		Males.	*Females.*
20 years and under,	...	3	17
From 20 to 30 years,	...	5	14
30 „ 40 „	...	1	9
40 „ 50 „	...	1	11
50 „ 60 „	...	1	5
60 „ 70 „	...	4	1
70 „ 80 „	...	0	2
80 „ 90 „	...	0	1
90 „ 100 „	...	1	0

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XVII.—*Table No. 1., showing the number of Suicides from 1844 to 1845 in Zillah Humeerpore.*

Pergunnah.	1844.				1845.				1846.				1847.				1848.			
	Suicides.		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Humeerpore,	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0
Sumeerpore,	0	0	1	0	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0
Modha, ...	0	0	0	0	4	3	0	0	0	4	0	0	1	2	1	0	2	0	1	0
Jelalpore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gubrowlee, ...	1	3	0	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Kath, ...	1	10	2	1	0	7	0	1	1	4	1	2	1	3	1	0	1	6	2	2
Islampore, ...	1	0	0	0	0	0	0	0	2	0	0	2	1	0	2	0	2	2	1	0
Punwaree, ...	1	2	2	1	0	8	0	1	0	0	0	1	0	1	0	1	1	1	0	1
Soopa, ...	0	3	0	2	4	1	1	0	1	7	0	2	1	3	1	1	0	8	0	0
Kasheepore,	0	1	0	1	0	0	0	0	0	2	0	0	0	0	1	2	0	3	0	0
Total, ...	4	19	5	6	10	16	2	2	4	21	1	7	5	10	7	4	8	20	4	3
Total of both sexes, ...	23		11		26		4		25		8		15		11		28		7	

Pergunnah.	1849.				1850.				1851.				1852.			
	Suicides.		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Humeerpore,	0	1	0	0	0	0	0	0	0	0	1	0	1	1	0	0
Sumeerpore,	1	1	0	0	0	1	0	0	0	0	0	1	2	0	0	1
Modha, ...	2	1	0	0	0	2	0	0	0	3	1	1	0	2	0	1
Jelalpore, ...	3	2	2	1	0	1	0	0	0	0	0	0	0	1	0	0
Gubrowlee, ...	3	0	0	1	0	1	0	0	1	1	0	1	2	1	0	1
Kath, ...	0	6	0	1	0	1	0	0	0	3	0	0	0	3	1	2
Islampore, ...	1	0	1	1	1	1	0	0	0	1	0	1	1	1	1	0
Punwaree, ...	0	2	0	0	0	1	0	1	1	7	0	2	1	4	1	0
Soopa, ...	3	2	2	0	0	3	0	0	0	4	1	0	2	5	0	1
Kasheepore,	2	0	0	1	0	0	0	1	0	3	0	0	0	3	1	0
Total, ...	15	15	5	5	1	11	0	2	2	22	3	6	9	21	4	6
Total of both sexes, ...	30		10		12		2		24		9		30		10	

Pergunnah.	1853.				1854 (to June).				From 1844 to 1854.			
	Suicides.		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Humeerpore,	0	1	0	0	0	0	0	0	3	4	1	1
Sumeerpore,	1	0	1	0	0	0	1	0	6	4	5	2
Modha, ...	1	0	0	0	1	0	0	0	11	17	3	2
Jelalpore, ...	1	1	0	0	2	0	0	0	6	5	2	1
Gubrowlee, ...	0	5	0	1	0	0	2	0	8	15	2	4
Kath, ...	1	5	1	2	0	1	0	0	5	49	8	11
Islampore, ...	0	1	1	0	1	2	0	0	10	8	6	4
Punwaree, ...	1	8	1	3	0	1	1	1	5	25	5	12
Soopa, ...	1	3	1	1	0	2	0	1	12	41	6	8
Kasheepore,	1	6	0	0	0	2	0	0	3	20	2	5
Total, ...	7	25	5	7	4	8	4	2	69	188	40	50
Total of both sexes, ...	32		12		12		6		257		90	

XVIII.—*Table No. II., showing Castes of Persons who committed Suicide from 1851 to 1854.*

Castes.	1851.		1852.		1853.		1854.		Total.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Aheer, ...	0	1	0	2	0	1	1	0	1	4
Brahmin, ...	0	4	2	2	1	4	1	3	4	13
Bukkal, ...	0	2	0	0	1	1	0	0	1	3
Bhurbhoonja, ...	0	0	1	0	0	1	0	0	1	1
Bussor, ...	0	1	0	1	0	1	0	0	0	3
Chunar, ...	0	2	1	1	2	0	0	0	3	3
Dhobie, ...	0	0	0	0	1	0	0	0	1	0
Kachce and Malee, ...	1	2	0	4	0	1	0	0	1	7
Kayeth, ...	0	0	0	0	0	1	0	0	0	1
Kalar, ...	0	0	0	0	0	1	0	0	0	1
Kunjur, ...	0	0	1	0	1	1	0	1	2	2
Koomhar, ...	0	0	0	0	0	1	1	0	1	1
Koree, ...	0	1	1	3	0	1	0	0	1	5
Koormee, ...	0	1	0	0	0	0	0	0	0	1
Lodha, ...	1	2	0	4	1	6	0	3	2	15
Mochee, ...	0	0	0	0	0	1	0	0	0	1
Rajpoot, ...	0	1	0	1	0	2	0	0	0	4
Sonar, ...	0	1	0	2	0	0	0	0	0	3
Telee, ...	0	2	0	1	0	1	0	0	0	4
Mussulman, ...	0	2	2	1	1	1	1	0	4	4
Tumbolee, ...	0	0	0	0	0	0	0	1	0	1
Total, ...	2	22	8	22	8	25	4	8	22	77

Table No. III., showing the various Causes which led to the commission of the deed.

EXCITING CAUSES.

	Abuse.		*Anger.*		*Family Quarrel.*		*Grief.*		*Insanity.*		*Shame.*		*Sickness.*	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Aheer, ...	0	1	0	0	2	0	1	0	0	0	0	0	0	1
Brahmin, ...	1	0	0	1	0	1	0	0	0	1	1	0	2	10
Bukkal, ...	0	0	0	0	0	0	0	0	0	0	0	1	1	2
Bhurbhoonja, ...	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Bussor,...	0	1	0	0	0	0	0	0	0	1	0	1	0	0
Chumar,...	0	0	0	1	0	0	0	0	0	0	0	1	3	1
Dhobie, ...	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Kachee, &c., ...	0	0	0	0	0	0	0	1	0	1	0	0	1	5
Kayeth, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Kalar, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Kunjur, ...	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Koomhar, ...	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Koree, ...	0	0	0	0	0	1	0	0	0	0	0	0	1	4
Koormee, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Lodha, ...	0	2	0	1	0	1	0	0	0	0	0	0	2	11
Mochee, ...	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Rajpoot, ...	0	0	0	0	0	0	0	1	0	1	0	1	0	1
Sonar, ...	0	0	0	0	0	1	0	0	0	0	0	1	0	1
Telee, ...	0	2	0	0	0	1	0	0	0	0	0	1	0	0
Mussulman, ...	0	1	0	0	0	0	0	1	1	0	0	0	3	2
Tumbolee, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total, ...	1	7	0	3	2	5	1	4	1	4	2	6	17	46

XIX.—*From Secretary to Government, North-Western Provinces, to Commissioner of Allahabad, Camp Banda, Judicial Department, No. 25B., dated the 16th February, 1855.*

I AM desired to forward, for your information, the accompanying copies of a demi-official report, and its enclosures, received from Mr. R. Spankie, late Officiating Magistrate of Humeerpore, on the prevalence of suicide in that district.

2.—I am desired to observe, that the subject many years ago repeatedly attracted the attention of the Government, and is one to which, from the reported unusual prevalence of the crime in this quarter, much interest attaches.

Para. 12 of Letter from Secretary to Government, N.-W. P., to Commissioner of Allahabad, dated 18th July, 1840, No. 2240.
Para. 30 of Letter from Secretary to Government, N.-W. P., to Commissioner of Allahabad, dated 7th June, 1842, No. 1061.

3.—It appears to the Lieutenant-Governor highly important that the real facts as to the extent and causes of the crime should be thoroughly ascertained and elucidated.

4.—The numbers, as taken from the Police reports,* present such fluctuations as might naturally be expected to occur. The variations shown are therefore in favour of the accuracy of the results generally.

	Suicides.	*Attempts.*
* 1844, ...	23	11
1845, ...	26	4
1846, ...	25	8
1847, ...	15	11
1848, ...	28	7
1849, ...	30	10
1850, ...	12	2
1851, ...	24	9
1852, ...	30	10
1853, ...	32	12
1st half of 1854,... ...	12	6

5.—The local authorities entertain no suspicions that reports of suicide have been used with any frequency as a cover to cases of homicide. And it is difficult to imagine any motive which should lead to the fabrication by the police of returns of this nature.

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6.—The large proportion of attempted suicides is, also, inconsistent with the supposition that cases of suspicious death have been concealed under this designation. The parties escaping from any attempted violence, would no doubt, have complained of it.

7.—The prevalence of the crime is attributed by the late Magistrate mainly to the attacks of disease and severe pain, and to the fact that the women suffer from infirmity, induced by the insupportable toil exacted from them in the fields. The latter supposition, however, seems not borne out by the ages at which suicide is most prevalent among the females. From the statement, as quoted in the margin,* it will be seen that the greatest proportion of suicides occur below the age of 30, and not at the more advanced periods, when the constitution would most readily sink under fatigue.

	Females.
* 20 years and under, ...	17
20 to 30, ...	14
30 to 40, ...	9
40 to 50, ...	11
Total, ...	51

8.—It appears to the Lieutenant-Governor that the subject will afford an interesting and useful field for investigation by the Civil Assistant Surgeon of Humeerpore, and it is contemplated to depute him, as suggested by Mr. Spankie, during the next cold season, into the interior of the district, where he will be able to enquire into the alleged unusual prevalence of disorders, such as are said to induce the practice of self-destruction.

9.—Meanwhile, it is desirable that an enquiry should be carefully made by the officers in charge of the districts of Jaloun and Banda, in which, as they adjoin Humeerpore, and are very similarly situated as regards climate and natural features, it may reasonably be expected that like results should be experienced. The officers in charge of those districts will endeavour fully to elicit the belief current

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among the people as to any special prevalence of the crime in those quarters, and as to the circumstances and motives which are supposed to lead to it, and they will furnish an early report of the result for the information of Government.

10.—The Lieutenant-Governor proposes, on the receipt of the replies from those officers, to print and circulate the correspondence, in order that general attention may be drawn to the subject.

11.—You will be pleased to call upon the Magistrate and Collector of Banda for the report indicated, furnishing him with a copy of the reports of Messrs. Spankie and Freeling, and of this letter.

12.—A similar call will be made upon the Deputy Superintendent of Jaloun, through the Commissioner of Saugor.

XX.—From Major W. C. Erskine, Commissioner of the Saugor and Nerbudda Territories, to W. Muir, Esq., Secretary to Government, North-Western Provinces, Agra, No. 201, *dated Jubbulpore,* 17*th May,* 1855.

Police.

WITH reference to your Letter No. 27B., dated the 16th February last, enclosing correspondence regarding the reported prevalence of suicide in the Humeerpore District, and requesting a report on the subject from the Deputy Superintendent at Jaloun, I have the honour to state, that I called for a report, not only from the Deputy Superintendent of Jaloun, but from the Deputy Superintendents of the other Bundelkund districts in my division and now enclose those mentioned in the margin.*

* 1.—No. 120, dated 7th April, 1855, from Deputy Superintendent, Jaloun.
2. No. 104, dated 3rd May, 1855, from Deputy Superintendent, Jhansie.
3.—No. 146, dated 11th April, 1855, from Deputy Superintendent, Chundeyree.

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2nd.—As far as my own observation goes, from a nine years' residence as Magistrate in Chundeyree and Jaloun, I do not think that the agricultural classes are more given to suicide than other poor people, if you allow for the greater number of poor being agriculturists in Bundelkund.

3rd.—The more ignorant the people are the less they appear to fear death, when it will relieve them from any temporary trouble.

4th.—Women of all the lower description of castes and trades appear to commit suicide on the most trivial cause of vexation;—sometimes out of fear of their husband's being angry with them; others from a belief that their blood will be on the head of the persons who annoy them; others to relieve themselves of temporary pain.

5th.—I have known a woman throw herself down a well, with the intention of drowning herself, merely because the iron bucket with which she was drawing water fell in.

6th.—Another, because her sick husband asked her to cook him some bread early in the morning.

7th.—A third, because a camel had eaten her *neem* tree.

8th.—And many other cases, owing to trifling annoyance or quarrels.

9th.—Drowning in wells is the usual way. Wells in India cannot be so covered as to prevent people throwing themselves in, though bars will prevent people falling in by accident.

10th.—I think women seldom hang themselves, but men often adopt this mode, or shoot themselves, if they possess guns. Sharp instruments are not often used by natives in Bundelkund to kill themselves with, and poison is still less frequently used.

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11*th.*—There can be no doubt that in one year there are many more suicides than in another, and that certain localities are notorious for it; but it is a well-known fact and saying, "One suicide causes another:" this may be owing to the depression of spirits caused by the sudden loss of an acquaintance, who was known to suffer distress of some kind, and to their belief that all cares cease with life.

XXI.—From W. Balmain, Esq., Deputy Superintendent of Jaloun, to the Superintendent at Jhansie, No. 120, *dated Oraie, the 7th April,* 1855.

I HAVE the honour to furnish the report on the prevalence and causes of suicide in the Jaloun district, called for by the Orders of Government, February 16, 1855.

2*nd.*—I regret that the returns required by Mr. Spankie did not reach in time to be embodied in his report. Delay occurred in their compilation in the record-offices of some of the assistants.

3*rd.*—For facility of comparison, the accompanying statements are drawn out in nearly the same form as those furnished from Humeerpore. In those showing the supposed cause, the caste, age, &c., &c., suicides and attempts have been entered together, these facts being independent of the actual result of the attempt at self-destruction; neither do they show the particulars of all cases which have occurred during a certain number of years, as the records of some of the pergunnahs are more complete than those of others. The correctness of the result, however, I imagine, will not be affected by this.

4*th.*—The area of the district is about 1,800 square miles. The population (estimated) is about 3,50,000.

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5*th.*—It is doubtful whether the table showing the actual number of suicides and attempts is correct or not. It has been twice completed in the several record-offices of the assistants, and at the Sudder, but some cases may have escaped notice; others very probably may not have been reported. The particulars of the cases, however, entered in the other tables, are, I think, correct, as I have myself gone through each *misl.*

6*th.*—*Extent.* Suicide in Jaloun appears to be rather more prevalent than in Humeerpore: in the former, ·0074, and in the latter ·0063 per cent. The population of Jaloun is, however, merely a rough estimate, and this may make the above percentage wrong. In parts of the Saugor Division, I imagine suicide to be much more common than in Bundelkund; while in Cawnpore the number is surprisingly small: the fluctuation in the number for different years is very great, showing that either the cases entered are too few to allow of a correct average being deduced, or that in particular years the exciting causes are greater. It will be seen, however, from Table C., that in 101 cases, whose causes were ascertained, only 39 were caused by sickness; the others originated in circumstances not likely to be affected by the season.

7*th.*—*Sexes.* Out of 154 persons who committed, or attempted to commit, suicide, 67 were men, and 87 women; out of the 101 cases whose causes were ascertained, 28 women and 11 men were urged on by sickness, and 36 women and 26 men by other causes. I do not know whether this difference is greater than is to be expected from the greater liability to disease, and from the inferiority in mind and in mental firmness, of the women of this country, as compared with the men.

8*th.*—*Ages.* The table of ages is very imperfect, but shows that the majority of suicides are committed in the prime of life.

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9*th.*—*Castes.* It is difficult to judge amongst what class suicide chiefly prevails, without a knowledge of their comparative numbers. The cases of Brahmins (19) are perhaps many, as compared with their numbers, but the suicides of Chumars (9), Kachees (11), Lodhees (10), and Rajpoots (10), are not more than proportioned to the extent of this class of the population. Chumars and Kachees are found in every village. Lodhees form a considerable part of the agricultural population in some pergunnahs, and are very numerous;—the same may be said of the Rajpoots, particularly in Kuchwahagar.

10*th.*—*Causes.* 39 out of 101 suicides, or attempts, appear to have been caused by sickness; 62 by other circumstances. Of these latter, disputes between man and wife are the most numerous—17; personal quarrels, 14; disputes regarding property—including suits in Court 8. Of 39 cases caused by sickness, no less than 26 are attributed to pain in the stomach, "*pet ka dard;*" but on analyzing this number, it appears that about 10 were cases of sudden and spasmodic pain, four or five from chronic diseases, and the rest not known. The natives cannot well distinguish, and still less specify, the numerous different diseases which cause a pain in the stomach, and hence in our police reports these are all lumped together. I do not think that Table C. bears out the opinion that the suicides amongst the women in this district are caused by over-work, inducing sickness; out of 64 cases of female suicide, 28 were caused by sickness, or 44 per cent. The proportion of suicides from sickness amongst the

Brahmin	women, is	5	out of	12;	Lodhee	women,	is	3	out of	6;
Chumars	"	3	"	5;	Kachee	"		3	"	7;
Koormees	"	3	"	5;				—		—
						Total,		17,		35;

showing 48 per cent. amongst those chiefly employed in field labour: the difference between this and the general

percentage from sickness, 44, is not sufficient to warrant the conclusion. It is a difficult question to say what circumstances may not be sufficient to cause a native to commit suicide. In one of the cases entered in the tables, a man lost four rupees, which dropped from his *kumurbund*; out of grief he committed suicide. I have known a pigeon-flyer attempt suicide, on account of his pigeons not obeying his call, and flying perversely. The natives do not appear to think suicide a crime, nor are they restrained by any moral or religious considerations.

11*th.—Modes of Death.* In 75 out of 116 cases drowning was chosen as the means of self-destruction, and of these 43 were women. This mode of death is that most easily accomplished, and requires no preparation. Shooting or stabbing requires a weapon, and are for the most part beyond the reach of women; and are, moreover, a more shocking kind of death than drowning. Poison, likewise, requires to be obtained from somewhere, and a considerable time must elapse before it can be taken, giving space for a change of mind. A rope is more easily obtained; but a well or a tank is always at hand, and a person can execute the intention of suicide at once, while the passions are still inflamed. Drowning appears also to be preferred for itself, as people with incurable sickness generally adopt this method, though they have time enough to choose others if they wished. There can be no doubt but that the number of open wells is a great help to persons committing suicide. If wells were all covered up, as in England, many would have to give up the purpose of self-destruction for want of the means, and others would have time for second thoughts, which might, in the meantime, appear the best. But covering up the wells in this country, in such a manner that a person, even if he wished, could not throw himself down, would be difficult and expensive. . . . .

12*th.*—*Prevention.* The crime may be prevented by taking away the cause, or the means, or by a fear of punishment. Of the causes entered in Table C., the 2nd and 5th might be remedied, if people could get speedy redress otherwise; Nos. 1, 3, 4, 6, 7, and 8, for the most part act suddenly, and cannot be controlled. In chronic diseases, medical assistance might avail, but it would be impossible to afford it generally in cases of sudden sickness. As stated in paragraph 11, covering over wells would remove the most ready means of suicide. With regard to punishing those who attempt, but do not succeed in suicide, it must proceed partly in the supposition that the persons do not really intend to die, but make a pretence of self-destruction, to annoy or injure others. It can have no effect in staying a man determined to die. In the attempts entered in Table A. punishment was hardly ever awarded; the persons were admonished, or *moochulkas* taken from them or their relations. In Saugor, there was a circular of the Sessions Judge calling on District Officers to punish attempts at suicide, and this was generally done; but with what effect could only be ascertained by a careful comparison of statistics.

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TABLE A.

Stations.	1849.				1850.				1851.				1852.				1853.				1854.				Total.			
	Suicides.		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*	
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
Jaloun, ...	0	0	0	0	0	0	0	0	0	0	0	0	3	3	1	0	3	5	0	1	0	2	0	0	6	10	1	1
Oraie, ...	0	0	0	0	1	1	0	1	0	0	0	0	0	1	0	0	1	1	1	0	0	0	1	0	2	3	2	1
Duboh, ...	0	0	0	0	0	0	1	1	3	4	1	2	0	0	0	1	2	0	0	0	1	1	1	0	6	5	3	4
Koonch and Calpee, ...	0	2	0	0	3	4	0	0	1	5	1	4	2	3	3	1	3	2	0	1	1	0	1	2	10	16	5	8
Kuchwahagar, ...	1	2	1	0	3	3	0	1	4	4	0	2	4	6	1	2	2	2	0	0	2	1	0	0	16	18	2	5
Bhandere, ...	3	0	0	0	0	0	0	0	2	4	2	2	0	4	2	0	1	6	1	0	2	0	1	0	8	14	6	2
Total, ...	4	4	1	0	7	8	1	3	10	17	4	10	9	17	7	4	12	16	2	2	6	4	4	2	48	66	19	21
Total of both sexes, ...	8		1		15		4		27		14		26		11		28		4		10		6		114		40	
Grand Total, ...	9				19				41				37				32				16				154			

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TABLE B.

Station.	Sex.	Aheer.	Brahmin.	Bukkal.	Beldar.	Byragee.	Burhal.	Bussoree.	Barber.	Chumar.	Cheepee.	Dhanuk.	Dhobee.	Goojur.	Ghosee.	Gurreeeah.	Kachee.	Kungur.	Koombar.	Koree.	Koormee.	Lohar.	Lodhee.	Mussulman.	Rajpoot.	Surraf.	Telee.	Not known.	Total.
Jaloun, ...	Male, ...	0	2	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	7
	Female,... ...	1	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	1	11
Oraie, ...	Male, ...	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
	Female,... ...	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
Duboh, ...	Male, ...	0	1	0	0	0	0	0	2	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	2	9
	Female,... ...	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0	9
Koonch and Calpee,	Male, ...	0	0	1	2	1	1	0	0	2	0	0	0	0	1	1	0	0	0	0	1	1	0	2	1	1	0	0	15
	Female,... ...	0	4	2	1	0	0	0	0	2	2	0	1	0	0	1	2	0	0	0	4	0	2	0	1	0	2	0	24
Kuchwahagar, ...	Male, ...	0	1	0	0	0	0	0	0	1	0	2	0	0	0	0	1	0	0	1	0	0	0	1	2	0	1	8	18
	Female,... ...	0	1	0	0	0	0	0	0	2	0	1	0	0	0	2	2	0	0	0	0	0	0	0	3	0	0	12	23
Bhandere, ...	Male, ...	0	2	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3	1	0	0	0	2	0	2	0	2	0	14
	Female,... ...	3	2	0	0	0	0	0	0	0	0	0	0	1	0	1	1	2	0	1	0	1	1	0	0	0	2	1	16
Total, ...	Male, ...	0	6	4	2	1	1	1	2	4	0	3	1	1	2	2	3	3	1	1	1	2	4	3	5	1	3	10	67
	Female,... ...	4	13	4	1	0	0	0	1	5	2	1	1	1	0	4	8	2	0	5	4	1	6	0	5	0	5	14	87
Total of both sexes, ...		4	19	8	3	1	1	1	3	9	2	4	2	2	2	6	11	5	1	6	5	3	10	3	10	1	8	24	154

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TABLE C.

Station.	Sex.	Aheer.	Brahmin.	Bukkal.	Beldar.	Byragee.	Burhai.	Bussoree.	Barber.	Chumar.	Cheepee.	Dhanuk.	Dhobee.	Goojur.	Ghosee.	Gurrereeah.	Kachee.	Kunjur.	Koomhar.	Koree.	Koormee.	Lohar.	Lodhee.	Mussulman.	Rajpoot.	Surraf.	Telee.	Not known.	Total.
Anger, arising from personal quarrels,	Male, ...	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0	1	0	7
	Female, ...	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2	0	0	0	0	0	7
Anger, arising from disputes regarding property, ...	Male, ...	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1	0	6
	Female, ...	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Anger, arising from disputes between man and wife, ...	Male, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
	Female, ...	1	1	0	0	0	0	0	1	2	0	0	1	0	0	0	2	0	0	1	0	1	1	0	0	0	3	0	14
Maltreatment, ...	Male, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	4
	Female, ...	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
By way of *dhurna*,	Male, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
	Female, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grief, ...	Male, ...	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	Female, ...	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5
Shame, ...	Male, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	Female, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	3
Insanity, ...	Male, ...	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Female, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	3
Sickness, not known, ...	Male, ...	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	5
	Female, ...	0	3	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	8
Pain in the stomach, ...	Male, ...	0	0	0	0	1	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	6
	Female, ...	1	2	0	0	0	0	0	0	1	0	0	0	0	0	2	2	0	0	2	2	0	3	0	3	0	1	1	20
Other causes, ...	Male, ...	0	2	4	0	0	0	0	0	0	0	3	0	1	1	2	2	0	0	0	0	0	0	2	3	0	1	10	31
	Female, ...	1	1	1	0	0	0	0	0	0	0	1	0	1	0	0	2	0	0	0	0	1	0	0	2	0	0	12	22
Total, ...	Male, Female, ...	4	19	8	3	1	1	1	3	9	2	4	2	2	2	6	11	5	1	6	5	3	10	3	10	1	8	24	154

TABLE D.

Causes.	Sex.	Aheer.	Brahmin.	Bukal.	Beldar.	Byragee.	Burhai.	Bussoree.	Barber.	Chumar.	Cheepee.	Dhanuk.	Dhobee.	Goojur.	Ghosee.	Gurrereeah.	Kachee.	Kunjur.	Koomhar.	Koree.	Koormee.	Lohar.	Lodhee.	Musulman.	Rajpoot.	Surraf.	Tele.	Not known.	Total.
Drowning in wells, ...	Male, ...	0	0	1	2	1	0	1	1	3	0	1	1	0	1	1	3	1	1	0	1	1	2	2	1	1	1	0	27
	Female, ...	2	9	2	1	0	0	0	0	2	1	0	0	0	0	2	6	1	0	3	3	0	5	0	3	0	2	1	43
Drowning in tanks or rivers, ...	Male, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Female, ...	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	5
Hanging, ...	Male, ...	0	5	2	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	1	0	0	2	0	2	0	0	0	16
	Female, ...	1	1	0	0	0	0	0	1	2	1	0	1	1	0	0	1	0	0	0	1	1	0	0	0	0	2	0	13
Poison, ...	Male, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3
	Female, ...	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Shooting or stabbing, ...	Male, ...	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0	1	1	7
	Female, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Not known, ...	Male, ...	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	9	15
	Female, ...	0	1	1	0	0	0	0	0	1	0	1	0	0	0	2	1	0	0	0	0	0	0	0	2	0	1	13	23
Total, ...	...	4	19	8	3	1	1	1	3	9	2	4	2	2	2	6	11	5	1	6	5	3	10	3	10	1	8	24	154

TABLE E.

	Under 20.	20—29.	30—39.	40—49.	50—59.	60.	Not known.
Men, ...	2	13	3	8	0	6	35
Women, ...	5	16	9	6	3	3	45
Total, ...	7	29	12	14	3	9	80

TABLE F.

Living in towns, ...	Male, ...	5
	Female, ...	13
Living in villages, ...	Male, ...	32
	Female, ...	43
Not known, ...	Male, ...	30
	Female, ...	31

XXII.—*From Lieutenant F. D. Gordon, Deputy Superintendent, Jhansie, to Captain A. Skene, Superintendent, Jhansie, No. 104 of 1855, dated Jhansie, the 3rd May, 1855.*

I HAVE the honour to transmit, herewith, the return called for in your Docket No. 124F., dated the 23rd of March last, regarding the prevalence of suicides and attempts to commit the same in the Jhansie district.

2.—Some delay has occurred in the preparation of this return, owing to there not being any separate records of the offence; consequently, the required information had to be collected from the diaries of the several thannahs.

3.—I have confined the return to such cases as have taken place during the past five years.

4.—The number of cases reported from the pergunnahs of Mote and Gurotha is out of all proportion small; the only explanation the assistants of those two districts can offer is, that the police were prohibited from ever

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making any enquiries into such cases, and that attempts to commit it were never investigated or punished.

5.—From a reference to the memorandum of the caste of persons chiefly affected, it does not appear that there is any preponderance in the agricultural population; Bukkals and Brahmins are the most numerous.

6.—The number of female sufferers is, as usual, nearly three times as great as the number of males, and it would appear that recourse is more often had to wells than to any other means of death. This is but natural; the well is generally close at hand, and no preparation is required. Abuse, a slight quarrel, or a sharp pang of sickness, prompts the sufferers to put an end to his or her existence, and they forthwith throw themselves down the nearest well.

7.—Family quarrels and sickness appear to have caused the deaths of no less than 91 persons out of the number reported; *viz.*, 130.

8.—More cases appear to have taken place in the pergunnah of Mhow than elsewhere. This pergunnah is only separated from that of Punwaree in Humeerpore by the river Dessaun.

9.—The population or area of this district has not yet been ascertained, nor have I been able to obtain any information regarding the average ages of the sufferers, nor as to the general opinion of the people on the subject.

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A.

Return of the number of Cases of Suicide reported by the Police in the District of Jhansie during the past five years.

Year.	Pergunnah.	Abuse.		Anger.		Family Quarrels.		Grief.		Insanity.		Shame.		Sickness.		Total.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1850.	Jhansie, ...	1	0	0	1	1	8	0	1	1	1	0	0	1	2	4	13
"	Mhow, ...	0	0	0	0	0	4	0	0	0	0	0	3	2	2	2	9
"	Puchore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
"	Kurehra, ...	0	1	0	0	0	3	0	0	0	0	0	0	1	1	1	5
"	Mote, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
	Total, ...	1	1	0	1	1	15	0	1	1	1	0	3	4	8	7	30
1851.	Jhansie, ...	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
"	Mhow, ...	0	2	0	0	1	2	0	0	0	0	0	0	2	2	3	6
"	Puchore, ...	0	2	0	0	1	0	0	0	0	0	0	0	0	0	1	2
"	Kurehra, ...	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2
"	Mote, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total, ...	0	6	0	0	2	2	0	0	0	0	0	1	3	3	5	12
1852.	Jhansie, ...	0	0	1	0	0	2	0	1	1	0	0	0	3	1	4	5
"	Mhow, ...	0	1	0	0	0	4	0	1	1	1	0	0	2	8	3	15
"	Puchore, ...	0	1	0	0	0	1	0	0	0	0	1	0	0	0	1	2
"	Kurehra, ...	0	0	0	1	0	1	0	1	0	0	0	0	1	3	1	6
"	Mote, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total, ...	0	2	1	1	0	8	0	3	2	1	1	0	6	12	9	28
1853.	Jhansie, ...	0	0	1	0	0	0	0	0	0	1	0	0	0	0	1	1
"	Mhow, ...	0	0	0	0	0	0	0	0	1	1	0	0	2	3	3	4
"	Puchore, ...	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	3
"	Kurehra, ...	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
"	Mote, ...	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
	Total, ...	2	0	1	1	0	1	0	0	1	2	0	1	3	5	7	10
1854.	Jhansie, ...	0	1	0	0	1	4	0	0	0	0	0	0	0	1	1	6
"	Mhow, ...	0	0	0	0	2	3	0	0	0	1	1	0	1	0	4	4
"	Puchore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
"	Mote, ...	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
"	Gurotha, ...	0	1	0	0	0	0	0	0	0	0	0	0	3	1	3	2
	Total, ...	0	2	0	0	3	7	0	0	0	1	1	0	5	3	9	13
	Grand Total, ...	3	11	2	3	6	33	0	4	4	5	2	5	21	31	37	93

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B.

Return of the Number of Cases of Attempts to Commit Suicide reported in the District of Jhansie during the past five years.

Year.	Pergunnah.	Abuse.		Anger.		Family Quarrels.		Grief.		Insanity.		Shame.		Sickness.		Total.	
		Males.	Females.	Males.	Females.	Males.	Females	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1850.	Jhansie, ...	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	3
"	Mhow, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
"	Puchore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mote, ...	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1
"	Gurotha, ...	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Total, ...	1	2	0	2	0	0	0	0	0	0	0	1	1	0	2	5
1851.	Jhansie, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	2
"	Mhow, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Puchore, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mote, ...	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total, ...	0	2	0	0	0	1	0	0	0	0	1	0	0	1	1	4
1852.	Jhansie, ...	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	3
"	Mhow, ...	1	0	0	0	0	4	0	0	0	0	0	0	0	0	1	4
"	Puchore, ...	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mote, ...	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
"	Gurotha, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total, ...	1	0	3	0	0	7	0	0	0	0	0	1	0	0	4	8
1853.	Jhansie, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mhow, ...	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4
"	Puchore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mote, ...	0	1	0	0	1	0	0	0	0	0	1	0	1	1	3	2
"	Gurotha, ...	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	2
	Total, ...	0	4	0	0	1	2	0	0	0	0	1	1	1	1	3	8
1854.	Jhansie, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mhow, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Puchore, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Kurehra, ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
"	Mote, ...	0	1	0	1	1	1	0	0	0	0	0	0	0	0	1	3
"	Gurotha, ...	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
	Total, ...	1	1	0	1	1	1	0	0	0	0	0	1	0	0	2	4
	Grand Total, ...	3	9	3	3	2	11	0	0	0	0	2	4	2	2	12	4

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C.

Pergunnahwar Abstract of Cases of Suicide during a period of five years.

Station.		Abuse.		Anger.		Family Quarrels.		Grief.		Insanity.		Shame.		Sickness.		Total.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Jhansie,	...	1	2	2	1	2	14	0	2	2	2	0	1	4	4	10	27
Mhow,	...	0	3	0	0	3	13	0	1	2	3	1	3	9	15	15	38
Puchore,	...	0	3	0	1	1	2	0	0	0	0	1	1	0	1	2	8
Kurehra,	...	1	2	0	1	0	4	0	1	0	0	0	0	3	7	4	15
Mote,	...	1	0	0	0	0	0	0	0	0	0	0	0	2	0	3	0
Gurotha,	...	0	1	0	0	0	0	0	0	0	0	0	0	3	4	3	5
Total,	...	3	11	2	3	6	33	0	4	4	5	2	5	21	31	37	93
Attempts to Commit.																	
Jhansie,	...	0	3	0	1	0	3	0	0	0	0	0	0	0	1	0	8
Mhow,	...	1	3	0	1	0	5	0	0	0	0	0	0	0	0	1	9
Puchore,	...	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Kurehra,	...	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mote,	...	0	2	2	1	2	2	0	0	0	0	2	1	2	1	8	7
Gurotha,	...	2	0	0	0	0	1	0	0	0	0	0	2	0	0	2	3
Total,	...	3	9	3	3	2	11	0	0	0	0	2	4	2	2	12	29

Memorandum of Suicides.

By hanging,	...	30
By shooting themselves,		2
In wells,	...	75
By sword wounds,	...	2
By poison,	...	9
By opium,	...	10
In rivers,	...	2
Total,	...	130

Memorandum of Attempts.

In wells,	...	26
By cutting throat,	...	2
By opium,	...	9
By hanging,	...	2
By poison,	...	2
Total,	...	41

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D.

Memorandum of the Class, i. e., *Caste, of People affected.*

	Caste.	Suicides.	Attempts.	Total.		Caste.	Suicides.	Attempts.	Total.
Agricultural.	Lodhee, ...	9	5	14		Brought forward,	72	23	95
	Koormee, ...	1	0	1					
	Aheer, ...	5	4	9	*Trades.*	Hujjam, ...	2	1	3
	Kunjur, ...	5	1	6		Sonar, ...	0	1	1
	Kachee, ...	12	2	14		Lohar, ...	3	0	3
	Shepherd, ...	4	1	5		Tumbolee, ...	1	0	1
	Koonjra, ...	0	1	1		Koree, ...	9	3	12
Trades.	Bukkal, ...	20	2	22					
	Kuhar, ...	3	0	3		Mahomedans,... ...	2	2	4
	Bussor, ...	1	4	5		Rajpoots, ...	3	2	5
	Nudaf, ...	5	0	5		Brahmins, ...	14	5	19
	Carpenter,...	1	0	1		Religious mendicants,	5	2	7
	Telee, ...	4	2	6		Chumars, ...	17	1	18
	Raj (Mason),	1	0	1		Rawuts, ...	2	0	2
	Kalar,... ...	1	1	2		Kayeths, ...	0	1	1
	Carried over,	72	23	95		Total, ...	130	41	171

XXIII.—*From Lieutenant G. Browne, Deputy Superintendent of Chundeyree, to Captain A. Skene, Superintendent, Jhansie, No.* 146 *of* 1855, *dated Lullutpore,* 11*th April,* 1855.

In accordance with the instructions conveyed in Docket No. 129F., from your office, I have the honour to submit the following report on the subject under enquiry; *viz.,* the comparative prevalence or otherwise of suicide in this district, and the supposed exciting causes:—

2nd.—With a view to ascertaining, as correctly as possible, the number of cases which occur annually throughout this district, I have prepared statements in the same form as those forwarded with the correspondence; and from the result exhibited, a tolerably accurate opinion may be formed on the subject.

3rd.—Table No. 1 shows, Pergunnahwar, the number of cases of suicide, and of attempts, which have been reported

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from 1849 to 1854, both inclusive. No attempts at suicide would appear to have been reported in 1849, but it is more than probable that as many occurred in this year as in each succeeding one; and in consequence of this deficiency in my information, this table is not as accurate as I could have desired. At first sight the singular immunity of Pergunnah Bala Behut will attract attention, but this is easily accounted for; the pergunnah, though extensive in area, is very thinly populated, and a large proportion of it is jungle. Throughout the other pergunnahs the proportion appears fair enough, as regards the number of inhabitants in each, when we take into consideration the difference in the number of pergunnahs in the two returns. The scanty population of the Chundeyree districts generally, and the fact that no attempts are included in the return for 1849; the total of the attempts and of the suicides in Table No. 1, when compared with the returns for Humeerpore for the same years; does not convey the impression that suicide is less prevalent here. The tables show as follows:—Ten pergunnahs of Humeerpore: total of suicides and attempts, from 1849 to 1854 inclusive, 189; *viz.*, suicides, 140; attempts, 49. This would give an average of 19 cases to each pergunnah. Six pergunnahs of Chundeyree during the same period: total of suicide and attempts, 132; *viz.*, suicides, 104; attempts, 28; or an average of 22 cases to each pergunnah.

4th.—Table No. 2 exhibits the number of each caste who have either committed, or attempted to commit, suicide, within this period. Here, as in Humeerpore, the greater proportion of victims has been among the women of those castes who form the cultivating community in these parts; *viz.*, Aheer, Brahmin, Kachee, and Lodhee, whilst those of other castes show a far smaller average.

5th.—Table No. 3 shows the supposed cause which excited the parties to self-destruction, or to attempt it. This is

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drawn out according to caste, and also exhibits the method, or the attempted method, of death: the number who have been driven by sickness to take their own lives, or to attempt to do so, does not appear so strikingly large as in the return from Humeerpore; though even here it is considerable, especially in the case of women. From the scanty information afforded in the *misls* of the cases, I have been unsuccessful in my searches, both as regards the ages of the parties, and the nature of the ailments which excited them to the deed; but in several cases of women, I find an internal complaint assigned as the reason. Out of the total number (27) of women who sought death as a relief to their sufferings, it is to be observed that 16 are of the castes (as enumerated in paragraph 3) as following the calling of cultivators.

6th.—From an experience of two years at Saugor, where the cases of suicide or attempts were necessarily considerable (in proportion to the extent of the district), I have remarked, that on enquiring closely into the particular sickness which prompted the deed in such cases, I have frequently found it ascribed to an ailment known by the natives as "*soolh kee bimaree*;" they described it as attended with great pain, and as producing low and desponding feelings in the mind. In the case of females, the sickness which induced self-destruction has been similarly described, as some internal female complaint; but the cause of which I never enquired into, beyond that the sufferers were considered incurable. There may, of course, be many other causes for suicide in that district also, but I merely mention these two, as having particularly struck me whilst there, and the present report has brought the circumstances to my recollection again.

7th.—From enquiry, I do not find that suicide is ascribed by the natives to any particular cause in this dis-

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trict, nor do the returns lead to that conclusion. The chief and primary exciting causes appear to be family dissensions, and sickness in various forms. I regret that the sources of information at my disposal have not been sufficiently complete to enable me to detail more accurately the nature of these ailments, as well as the ages of the victims.

8*th.*—The corespondence forwarded by you is herewith returned, as directed.

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I.

Table showing the Number of Cases of Suicide and Attempts, Pergunnahwar, from 1848 *to* 1854, *inclusive, in the District of Chundeyree.*

PERGUNNAHS.	1849.				1850.				1851.				1852.				1853.				1854.				Total, from 1849 to 1854, inclusive.			
	Suicides.		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*		*Suicides.*		*Attempts.*	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
Lullutpore, ...	2	6	0	0	2	5	1	2	4	4	3	1	0	0	0	1	1	3	1	2	0	7	0	4	9	25	5	10
Chundeyree, ...	1	2	0	0	2	3	0	1	0	2	0	1	1	4	0	0	1	2	0	0	0	1	0	0	5	14	0	2
Bansie, ...	3	2	0	0	0	2	0	1	0	2	1	0	1	1	0	0	0	0	0	0	1	3	0	1	5	10	1	2
Mahrownee, ...	1	2	0	0	0	3	0	2	1	3	0	1	0	0	0	0	0	4	0	0	0	3	0	0	2	15	0	3
Bala Behut, ...	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	1	3	2	0	1
Tal Behut, ...	1	0	0	0	1	4	0	1	2	0	0	1	1	2	0	1	0	0	0	1	1	2	0	0	6	8	0	4
Total, ...	9	12	0	0	5	17	1	7	7	12	4	4	4	7	0	2	3	10	1	3	2	16	0	6	30	74	6	22
Total of both sexes,	21		0		22		5		19		8		11		2		13		4		18		6		104		28	

II.

Table showing the number of each Caste who have either committed Suicide or attempted to do so.

Castes.	1849.		1850.		1851.		1852.		1853.		1854.		Total of each Caste, from 1849 to 1854, inclusive.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males	Females.		
Aheer, ...	0	2	0	1	0	1	0	3	0	0	2	2	2	9
Brahmin, ...	2	1	0	5	4	3	0	0	0	0	0	2	6	11
Bukkal & Bunneeah,	0	1	1	1	0	0	0	0	0	1	0	3	1	6
Beldar, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Bussor, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Bhât, ...	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Burhai, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Chumar, ...	1	1	0	3	0	0	1	0	0	2	0	1	2	7
Dheemur, ...	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Dhobie, ...	0	0	2	0	0	0	0	0	0	0	0	0	2	0
Durzee, ...	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Ghosee, ...	0	0	0	1	0	1	0	0	0	0	0	0	0	2
Gurrereeah, ...	0	0	0	0	0	1	0	0	0	0	0	1	0	2
Kachee and Malee,	3	1	0	4	1	0	0	2	0	2	0	4	5	13
Kayeth, ...	1	0	0	0	0	0	0	0	0	0	0	1	1	1
Kalar, ...	0	0	0	1	0	1	0	0	0	0	0	0	0	2
Kunjur, ...	0	0	0	0	0	0	1	0	0	1	0	1	1	2
Koomhar, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Koree, ...	0	0	0	3	0	0	0	1	1	1	0	1	1	6
Koormee, ...	0	2	0	0	0	1	0	0	0	0	0	0	0	3
Lodha, ...	0	2	1	0	2	3	0	2	0	0	0	2	3	10
Mussulman, ...	0	0	0	0	1	0	0	0	0	2	0	0	1	2
Naee, ...	0	0	0	0	0	0	0	0	1	1	0	0	1	1
Rajpoot, ...	1	0	0	1	1	2	0	0	0	0	0	0	2	3
Sonar, ...	0	0	0	0	0	0	1	0	1	0	0	0	2	0
Senorea, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Sarhea, ...	0	0	0	0	0	1	1	0	1	0	0	1	2	2
Thakoor, ...	0	1	1	1	0	0	0	0	0	0	0	0	1	2
Telee, ...	0	0	1	1	1	0	0	1	0	2	0	1	2	5
Total, ...	8	12	7	24	10	17	4	10	4	12	2	20	36	96

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III.

Table showing the Cause and Method of Self-destruction, or Attempts thereat, from 1849 *to* 1854, *inclusive.*

Caste.	Not known.		Anger.		Family Quarrel.		Grief.		Insanity.		Shame.		Sickness.		Method of Death, or Attempts.					Total.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Hanging.	Drowning.	The knife.	Shooting.	Poison.	
Aheer, ...	0	1	1	0	0	3	0	1	0	0	0	1	1	3	4	6	1	0	0	11
Brahmin, ...	1	0	0	1	4	5	0	1	1	0	0	1	0	3	3	8	4	0	2	17
Bukkal and Bunneeah, ...	0	0	1	0	0	2	0	1	0	0	0	0	0	3	3	5	0	0	0	7
Beldar, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Bussor, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Bhât, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Burhai, ...	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1
Chumar, ...	0	0	0	0	0	4	0	1	0	0	1	1	1	1	3	5	1	0	0	9
Dheemur, ...	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Dhobie, ...	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2
Durzee, ...	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1
Ghosee, ...	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	2
Gurrereeah, ...	0	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	2
Kachee and Malee, ...	1	0	1	2	0	5	0	2	0	0	0	0	3	4	3	14	1	0	0	18
Kayeth, ...	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	2
Kalar, ...	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	2
Kunjur, ...	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	2	0	0	0	3
Kumhar, ...	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Koree, ...	0	0	1	1	0	4	0	1	0	0	0	0	0	0	1	6	0	0	0	7
Koormee, ...	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	3	0	0	0	3
Lodha, ...	0	0	1	0	1	4	0	0	0	0	0	0	1	6	8	5	0	0	0	13
Mussulman, ...	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	2	0	0	0	3
Naee, ...	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	0	0	0	2
Rajpoot, ...	0	0	1	0	1	2	0	0	0	0	0	0	0	1	2	3	0	0	0	5
Sonar, ...	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2
Senorea, ...	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1
Sarhea, ...	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	4	0	0	0	4
Thakoor, ...	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	2	1	0	0	3
Telee, ...	0	0	0	0	0	3	0	0	0	0	0	0	3	2	2	6	0	0	0	8
Total, ...	2	3	8	9	10	39	1	13	1	1	1	4	14	27	39	83	10	0	2	132

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XXIV.—*From R. Lowther, Esq., Commissioner of Allahabad Division, to W. Muir, Esq., Secretary to Government, North-Western Provinces, Agra, No.* 103 *of* 1855, *dated Allahabad,* 13*th June,* 1855.

With reference to the 10th paragraph of your Letter dated 16th February, No. 25B., calling for a report on the prevalence of suicides in the Banda district, I have the honour to submit a letter from the Magistrate of that district, dated the 7th April, No. 52, with two statements—one showing the number of fatal cases and attempts during four years, from 1851 to 1854; the other exhibiting the number of accidental deaths during the same period. Of suicides, during that period, 46 cases are recorded, and 21 of attempts, giving a total of 67 cases. Of accidental deaths there are no less than 914.

2*nd.*—In 1841, the number of suicides in the Humeerpore district, exactly corresponded with the number reported in the Banda district in four years, while the number of attempts was greater by 7 cases. Drawing a comparison between these two districts, from 1851 to 1853, it will be found that the casualties in Humeerpore are more than two-fold in excess. From 1851 to 1853, there were 86 suicides and 31 attempts in Humeerpore, and 40 suicides and 18 attempts in Banda.

3*rd.*—Mr. Mayne, the Magistrate of Banda, remarks in paragraph 6 of his letter, that owing to a want of attention, a proper distinction is not drawn between suicides and accidental* deaths, and he thinks that the great

* The general records of the Criminal Courts of France present, from 1827 to 1831, annual accounts not only of suicides, but also of accidental deaths, which have come to the knowledge of the public Magistrate, of which the annexed is a detail.

Years.	*Accidental Deaths.*	*Suicides.*
1827, ...	4,744	1,542
1828, ...	4,855	1,754
1829, ...	5,048	1,904
1830, ...	4,478	1,756
1831, ...	5,045	2,084
Total, ...	24,170	9,040

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increase of reported suicides in Humeerpore may possibly be attributed to that cause. This opinion may be viewed as a conjecture founded on general principles: we have no comparative statement as our guide with respect to accidental deaths.

4th.—I am, however, disposed to differ from this view. The greatest care was taken by Mr. Taunton, the Magistrate, several years ago, to impress upon the police officers the necessity of watching the progress of the disease; they were strictly enjoined, at my request, to ascertain the circumstances connected with each casualty and each attempt; and they were especially warned against submitting any suspicious death until the facts were established, first by a careful enquiry, and then by an inquest. I personally communicated with Mr. Taunton on the subject, and he expressed some anxiety lest cases of a more grave character might be converted through intrigue into self-destruction.

5th.—My opinion is, that the returns from Banda are the least trustworthy of the two, because I believe that the police of that district never received any special instruction for their guidance: there is ordinarily a certain disgrace attaching to self-destruction; and it is hard to believe that any family would report, or allow to be reported, an accidental death as one of suicide. It is much more probable that a sense of shame, either arising out of infidelity, immorality, or family disputes, which frequently lead to abusive language, would induce a family to attribute a suicide to accidental circumstances, in order to prevent an investigation.

17th.—There are doubtless numerous cases of self-destruction which originate from similar causes; and in a country constituted as this is, where medical aid is not

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available, the wonder is, that suicide, superinduced by bodily sufferings and anguish, is not more extensively reported in other districts. Humeerpore, for some years, has stood alone in the prevalence of the crime. The force of habit and imitation may, I think, lead to a general increase. This, indeed, is conjectured by European writers on the subject.

XXV.—*From F. O. Mayne, Esq., Officiating Magistrate of Banda, to R. Lowther, Esq., Commissioner, 4th Division, Allahabad, No. 52, dated Banda, the 7th April, 1855.*

I HAVE the honour to acknowledge your Letter No. 27, dated 23rd February, 1855, with its enclosures (herewith returned), enquiring of the prevalence or otherwise of suicides in the Banda District.

2nd.—The enclosed Statement No. I. exhibits the number of suicides which have been reported as committed and attempted during the last four years, beyond which all records of this office have been destroyed. A comparison with the Humeerpore district stands thus:—

Year.	Banda.		Humeerpore.	
	Suicides.	*Attempts.*	*Suicides.*	*Attempts.*
1851, ...	12	5	24	9
1852, ...	13	9	30	10
1853, ...	15	4	32	12
1854, ...	6	3	½ year, 12	½ year, 6
Total, ...	46	21	98	37

A further comparison with the population, as per margin, induces me to think that suicide in the Banda district does not prevail to any remarkable extent.

	Census, January, 1853.
Banda, ...	7,43,872
Humeerpore, ...	5,48,604

3rd.—The result of personal enquiries from police officers and other people, during a hasty tour in my district, as also a conversation on the subject with my predecessor, Mr. Cust, before he left the district, leads me to the same conclusion.

4th.—The few cases which occur are attributed to the usual causes—want of chastity, infidelity, sickness, &c.

5th.—Out of curiosity, I also called for a statement of accidental deaths, which from their unnatural or suspicious nature have led to investigation during the last four years. The result is shown in No. II. Statement.

6th.—I am led to believe, that for want of sufficient attention, proper distinction is not drawn between suicides and accidental deaths. It is often difficult to determine which has happened, particularly in cases of deaths by drowning. A *punchayet-nameh* generally saves all further trouble and enquiries. The excess of reported suicides in the Humeerpore district may perhaps be attributed to some such cause.

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I.

Number of Suicides in the District of Banda.

Names of Thannahs.	1851. Suicides.					1851. Attempts.					1852. Suicides.					1852. Attempts.					1853. Suicides.					1853. Attempts.					1854. Suicides.					1854. Attempts.				
	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.	Men.	Boys.	Women.	Girls.	Total.
Kotwalee and Khundeh, ...	1	0	0	0	1	1	0	0	0	1	3	0	2	0	5	2	0	1	0	3	1	0	1	0	2	1	0	0	0	1	1	0	1	0	2	0	0	0	0	0
Seondah and Bisendah, ...	0	0	1	0	1	1	0	0	0	1	1	0	1	0	2	1	0	0	0	1	1	0	4	0	5	2	0	0	0	2	0	0	1	0	1	0	0	1	0	1
Tindwaree, ...	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Budousa and Kalinjur, ...	0	0	1	0	1	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	2	0	2
Tirohan, Bhownree, and Manikpore.	2	0	0	0	2	0	0	2	0	2	1	0	0	0	1	0	0	0	0	0	2	0	1	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
Mhow, Burgurh and Rajahpore, ...	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0
Kumasin, including Surdhooa and Puharee, ...	2	0	1	0	3	0	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Buberoo, including Murka, ...	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pylanee, ...	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total, ...	7	0	5	0	12	3	0	2	0	5	6	1	6	0	13	6	0	3	0	9	5	0	10	0	15	3	0	1	0	4	2	0	4	0	6	0	0	3	0	3

N. B.—Total number of Suicides, ... 46
Ditto ditto of Attempts, ... 21

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II.

Number of Accidental Deaths in the District of Banda.

Names of Thannahs.	1851. Snake-bitten.	1851. Drowned by falling into wells, tanks, rivers, &c.	1851. From other accidents.	1851. Total.	1852. Snake-bitten.	1852. Drowned by falling into wells, tanks, rivers, &c.	1852. From other accidents.	1852. Total.	1853. Snake-bitten.	1853. Drowned by falling into wells, tanks, rivers, &c.	1853. From other accidents.	1853. Total.	1854. Snake-bitten.	1854. Drowned by falling into wells, tanks, rivers, &c.	1854. From other accidents.	1854. Total.	Grand Total.
Banda Kotwalee and Khundeh, ...	15	30	36	81	5	5	8	18	5	6	7	18	13	8	4	25	142
Seondah and Bisendah, ...	10	10	12	32	15	3	2	20	20	13	4	37	16	10	4	30	119
Budousa and Kalinjur, ...	10	14	8	32	10	14	11	35	14	7	3	24	12	7	2	21	112
Tirohan, Manikpore, and Bhownree,	4	6	2	12	8	11	8	27	8	13	1	22	12	9	5	26	87
Mhow, Burgurh, and Rajahpore,...	11	19	4	34	3	8	5	16	5	4	1	10	12	6	3	21	81
Kumasin, Surdhooa, and Puharee,	6	4	0	10	23	7	6	36	18	4	3	25	13	4	8	25	96
Buberoo and Murka, ...	12	15	1	28	13	15	2	30	13	6	8	27	11	3	6	20	105
Pylanee, ...	8	7	4	19	20	9	6	35	1	1	7	9	8	9	3	20	83
Tindwaree, ...	3	6	14	23	9	7	4	20	13	0	1	14	18	4	10	32	89
Total, ...	79	111	81	271	106	79	52	237	97	54	35	186	115	60	45	220	914

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No. 2.

SUICIDE IN BUNDELKUND.

I.—*From* C. CHESTER, ESQ., *Commissioner, Allahabad Division, to* R. C. OLDFIELD, ESQ., *Assistant Secretary to Government, North-Western Provinces, Agra, No. 438 of 1856, dated Allahabad, the 26th April, 1856.*

Judicial Department.

WITH reference to the Orders of Government conveyed in your predecessor's Letter No. 5130, dated 20th December last, relative to the deputation of the Medical Officer at Humeerpore into the interior of that district to enquire into the prevalence of disorders said to induce suicide, I have the honour to submit, for the consideration of His Honor the Lieutenant-Governor, the accompanying report and statements from Dr. Clarke.

2.—On the 3rd March last, Dr. Clarke proceeded into the district, but was compelled to return after seventeen days, by extreme heat. During that brief period he of course had little opportunity of enquiring into the sanitary condition of the people generally, nor did he gain any insight into the particular diseases said to induce suicide.

3.—The Civil Surgeon's endeavours to acquire really valuable information from the *baids* or native physicians seem to have been very ineffectual, and it was hardly to be expected that they should discriminate nicely between cognate though different diseases. In the same manner, the Police records, which form the basis of Dr. Clarke's table, are not trustworthy, from the ignorance of the persons who drew them up; but they have been carefully analyzed, and as much information as possible has been extracted from them.

4.—During five years, from 1851 to 1855, 161 persons

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are reported to have committed suicide, of whom 33 were males and 128 females. In 115 of these cases physical causes, and in 46 of them moral causes, led to self-destruction. These are detailed in Table No. I.

5.—Dr. Clarke is unable, from the data before him, to come to any conclusion as to the influence of the seasons in developing suicidal tendencies. It would appear, however, from his Table No. III., that most cases occur in the months of August, September, October, and November,—a result which is contrary to the received opinion that an increasing temperature gives energy to the causes which lead to this crime.

6.—With regard to the locality in which suicide prevails most, the Table No. I. shows a great preponderance of the crime in Pergunnah Punwaree. Dr. Clarke cannot account for the fact, except by supposing that the people there are poorer than elsewhere, and compelled more commonly to use such food as produces the abdominal diseases which are the chief physical cause of suicide.

7.—Want of the moral sense, and ignorance of their responsibility as human beings, are in my opinion the remote causes for so many people killing themselves in Humeerpore, and I know of no remedy but education. The principal proximate cause seems to be pain produced by sickness; and this might be removed to a certain extent by the establishment of dispensaries in the interior of the district.

8.—The bodies of suicides said to have committed the crime on account of sickness might be sent into the station, to be examined by the Civil Surgeon, with a short report from the thannahdar of the nature of the disease.

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II.—*From Major* G. W. WILLIAMS, *Officiating Assistant Secretary to Government, North-Western Provinces, to* C. CHESTER, ESQ., *Commissioner, Allahabad Division, No. 2988, dated Agra, the 20th May, 1856.*

Judicial Department.

IN reply to your Letter of the 26th ultimo, No. 438, I am directed by the Hon'ble the Lieutenant-Governor to return Dr. Clarke's report on the prevalence of disorders in the interior of the Humeerpore District said to induce suicide, and to request that it may be forwarded to Messrs. Mayne and Freeling, for any suggestions of a practical nature which may occur to them, with a view to checking the tendency of suicide existing among the inhabitants of the pergunnahs in question.

III.—*From* C. CHESTER, ESQ., *Commissioner, Allahabad Division, to* R. C. OLDFIELD, ESQ., *Assistant Secretary to Government, North-Western Provinces, No. 702 of 1856, dated Allahabad, the 7th July, 1856.*

Judicial.

I HAVE the honour to acknowledge the receipt of your predecessor's Letter No. 2988, dated 20th May last, returning Dr. Clarke's report on the prevalence of suicide in Zillah Humeerpore, and requesting that it might be forwarded to Messrs. Mayne and Freeling, for any suggestions of a practical nature which might occur to them, with a view to check the tendency to this crime; and in reply to re-submit Dr. Clarke's report, together with letters in original from the above-named officers.

2.—Mr. Mayne considers that sickness, poverty, and distress, are the chief causes of the prevalence of suicide, while Mr. Freeling refers it to the absence of religious restraints.

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3.—Mr. Mayne thinks that the crime may be checked by improving the moral and physical condition of the people. Mr. Freeling would arrest the evil by severe and systematic punishment of all who are not successful in their attempts at self-destruction.

IV.—*From* J. C. CLARKE, ESQ., *Civil Assistant Surgeon of Humeerpore, to* T. K. LLOYD, ESQ., *Magistrate, Humeerpore, No.* 34 *of* 1856, *dated Humeerpore, the* 16*th April,* 1856.

IN accordance with the instructions contained in your Letter No. 38, dated 29th February, 1856, I have the honour to acquaint you that I proceeded on the 3rd of March into the interior of this district, to enquire into, and endeavour by personal observation to trace, the causes predisposing to suicide. I now beg to transmit to you the following remarks on the subject:—

The season selected for the investigation was far advanced, and the extreme heat (the thermometer ranging between 95° and 99°) which burst forth shortly after my departure compelled me to hasten my return. I visited Sumeerpore, Mondha, Gurrowlee, Khurela, Rath, Punwaree, Koolpahar, and Mahoba, and from thence I returned direct. I moved on to Mahoba, to make arrangements for the occupation of the small bungalow there by the native doctor, with a view to the establishment of a dispensary. I was absent on this tour 17 days. It scarcely needs mention that, in so short a space of time, and in such an atmosphere, I had no opportunity of personally enquiring into the sanitary condition of the people generally, nor yet of seeing any of those diseases stated to be common to the people of Bundelkund.

I held daily converse with the *baids*, and endeavoured to elicit from them the nature and symptoms of the diseases

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known under the popular terms "*baee gola*" and "*baee soolh,*" it having been assumed that *they are peculiar to these parts,* specific, and so *violent* in their *nature,* as to urge those attacked to self-destruction. The information I gained on those points shall be mentioned hereafter. I was at much pains, also, to learn something of other causes, besides sickness, which induce so many people, and more especially women, to commit suicide. But beyond receiving the reply of the fatalist, I learned nothing.

In the absence of medical evidence or any scientific data, a natural difficulty presents itself, to collect and tabulate the diseases and other causes which are supposed to have led to self-annihilation. This, however, I have endeavoured to do, by examining the Police records from 1851 to 1855—a period of five years; and although I have done my best to place each *physical* and *moral cause* under its proper head, yet from the loose expressions and scanty details which the records contain, the tables which I would beg to submit cannot be more than partially correct. In detail they must ever remain deficient, and all they will show is by way of generalization; and in this manner I hope they will be found to illustrate the physical and the moral causes, the seasons and pergunnahs, in which the greatest number of cases have occurred, and the sex most prone to this lamentable act.

I will now proceed to explain some of the terms used in the tables, and to offer some remarks on the various diseases.

Diseases of the abdomen.
"*Baee gola.*"
"*Baee soolh.*"
"*Pet durd.*"
"*Durd-i-shikkum.*"
Diarrhœa.
Dysentery.

Under this head will appear the well-known terms "*baee gola*" and "*baee soolh,*" the former signifying "*wind-ball,*" and the latter "*wind-pain.*" Synonymous with this latter term are the expressions "*pet durd*" and "*durd-i-shikkum;*" and these three, "*pet durd,*" "*durd-i-shikkum,*" and

"*baee soolh,*" as shown by Table I., stand in one column. The distinction drawn by the natives between these two so-called diseases, "*baee gola*" and "*baee soolh,*" is in their own language "*rup ki furuk.*" Those persons with whom I conversed on the subject stated that the symptoms of an attack were, most generally, costive bowels, *violent pain in the umbilical region, flatulency,* and frequently vomiting; and that the following grains*—a common enough food among the poorer class of people—were, if partaken of freely, or yet constantly, very provocative of the above symptoms. They likewise assured me that there were many varieties of these diseases. One person explained five, another three, and so on; but beyond what I have stated their ideas were so general and diffuse, that they are not worthy of mention. These *baids* were the only *physicians* I met with, and they possessed but a very rude and simple knowledge of disease or remedies.

* *Khodo.*
Mothee.
Pesahee.
Kakun.
Sanwa.

It is obvious that these diseases are, in very many instances, severe attacks of colic; and the nature of the colic, whether it be with or without flatulency, determines oftentimes whether the attack shall fall under the denomination of "*baee gola*" or *baee soolh.*" I do not mean to say that all the cases exhibited in Table I. under the heads of "*baee gola*" and "*baee soolh*" have been attacks of colic, nor do I wish it to be understood that these terms are synonymous with the term colic; but of what I feel assured is, that in a great number of cases, the one represents the other.

I do not regard the diseases, therefore, known generally by these names—"*baee gola*" and "*baee soolh*"—either as specific or as peculiar to Bundelkund.

It must not be supposed that *colic* is a simple disease, and not enough to *induce people peculiarly prone to suicide*

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to commit the act. Colic is a disease severe enough in itself, but if unrelieved, leading frequently to the most grave and fatal results.

That many other diseases fall under the terms "*baee gola*" and "*baee soolh,*" there can be no doubt. And inasmuch as the natives are so profoundly ignorant of the various structures and organs of the body, and possess so very limited a knowledge of its diseases, it would not be surprising, therefore, were it found that all the *affections of the abdomen* were classed under these terms or their synonyms. By way of illustration, I would mention the following instance. At Mondha a man was brought to me, said to be labouring under "*baee gola*:" I carefully examined him, and found him suffering from chronic inflammation of the liver, with considerable enlargement of that organ. In the Police records, also, I remarked a case returned as "*durd-i-shikkum,*" but the man's daughter stated before the thannahdar that he had not passed his water for seven days. The cause of his death was, doubtless, extravasation of urine.

Diarrhœa and dysentery are known by the terms in the margin;* but in the reports I found them so often confused, as to compel me to place them in one column, where in Table I. they will be found thus arranged.

* *Dust.*
Pet chulna.
Anw rukkal.
Pechish.

Table II. shows a general total of 115 persons who have, from some *physical cause,* destroyed themselves; and out of this number 57 persons, or 12 males and 45 females, have been urged to that act by some *abdominal* malady. The proportion under this head is great, and there is also a large disproportion between the males and females. The following explanation will, to some extent, account for

the one, and tend to diminish the magnitude of the other:—

1*st*,—In the entire cavity of the abdomen there are contained a number of very important organs, all subject to numerous diseases, some of which are very speedily fatal, and the greater number bearing with them severe pain, not unfrequently of an acute and excruciating character; and, moreover, a *very large proportion of the diseases of this country have their origin within its walls.* It is not so much to be wondered at, therefore, that a very large disproportion should arise between the class of disease now under consideration, and any other to be treated of hereafter.

2*nd*,—Admitting that many other diseases than colic are placed under the heads "*baee gola*" and "*baee sooth*," and observing that so large a number of females in regard to the males fall under these heads, the idea naturally suggests itself that the females suffer from a class of diseases peculiar to themselves. If, in a given civilized community of 50,000 people, a report on the status of disease were made, it would not be surprising to find only 10 males to 250 females suffering from affections of the generative organs. All these affections, of course, are not of a serious nature.

Allowing, then, that the females in this part suffer to some extent in the same ratio, it is not unreasonable to suppose, that in the midst of these peculiar ailments, they are sometimes urged to self-destruction.

Diseases of the brain, nervous system, and organs of sense.

Epilepsy.
Insanity.
Blindness.
Disease of nose.
Ophthalmia.

The diseases of the brain, nervous system, and organs of sense, show a total of 35 persons. Epilepsy 1 male, 3 females. Insanity, 3 males, 9 females. Blindness, 4 males, female. Disease of nose and headache, 12 females. Ophthalmia, 2 females.

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The natives have a most incorrect notion of insanity, and express such a state by a variety of terms. Yet it is probable enough that the persons above-mentioned laboured under some kind of mental alienation.

Disease of nose and *headache* have, according to Table II., urged 12 females to self-destruction. I was obliged to class them under one head, as, frequently, it was stated in the reports, "*headache*, and *pus* running from the nose;" "*headache*, and *worms* tumbling out of the nose;" "pain in the nose;" and *penus*, which signifies *caries* or disease of the bones of the nose.

Wonderful stories are related of these diseases, and one becomes horrified at hearing so frequently of worms tumbling out of people's noses. I met with no evidence, so as to enable me to form an opinion what particular diseases of the nose those people laboured under.

I have often met with cases at the dispensary, and also in the district, of that form known as polypus. Diseases of the nose do not of necessity generate worms; they, however, form a ready *nidus* for them, just as would any other disease of a like kind, if allowed to go unattended; and the absence of any relief is the reason, I presume, why these diseases are so often heard of, and present such curious features.

It is perhaps not so remarkable why so many females have been thus urged to an untimely end, as it is that not a single male has followed the same course, from the same disease.

Accidental causes.

The cases of insanity, blindness, and epilepsy, show in Table II. a total of 21, and should stand negatively in regard to the general total—115 persons, who have from *physical causes* destroyed themselves. The insanes might have laboured

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under a suicidal form of mania; the blind and the epileptics might have met with a fortuitous death. In the absence, therefore, of any reliable information on the actual state of those people, the cases should be regarded as accidental; and, if not so admitted, they should form a class *per se.*

There would then remain 21 males and 73 females, or a general total of 94, under physical causes.

Diseases of the respiratory organs.

Asthma is the only disease which falls under this head—3 males and 3 females.

Disease of the locomotive organs.

Rheumatism is the only disease under this head—1 female.

Diseases of the urinary organs.

One male only under this head, from extravasation of urine.

Diseases of uncertain sent.

Illness, 1 male and 1 female, abscess, 2 females, are the only cases under this head.

Diseases of the tegumentary system, syphilis, fever.

Leprosy, 4 females, 3 males.

There remain only two other diseases to be mentioned, *viz.*, syphilis and fever. These stand alone—as *syphilis,* 1 male, 3 females; *fever,* 1 female.

In reports which have gone before, gripes, *rheumatism,* and *ague,* have been cited as *causes* predisposing to suicide.

A griping pain often attends *diarrhœa,* but as I have only met with 8 cases of *diarrhœa* and dysentery, gripes should not take a very prominent position, and rheumatism and ague should stand in the lowest scale.

Influence of the seasons.

Table III. shows, that of the 57 cases which have occurred under the heads *abdominal diseases,* 27 have been induced during the *six cold season months,* and the remaining 30 during the six *hot season months.* In September and November the greatest

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number of cases are shown under moral causes. Respecting the *influence* of the *seasons*, therefore, I do not think, from this table, much importance attaches.

Ages.

Tables I. and IV. show the ages. As shown by Table IV., 128 females have committed suicide during the past five years, and 65 have been urged to that act at or under the age of 30. This fact would, at first sight, help to support opinions advanced elsewhere, that insupportable toil, child-bearing, attacks of disease, and severe pains, induce early and premature decay; uselessness, therefore, as members of working families; and hence riddance of life by self-destruction. On examination, however, of Table I., it will be seen that out of the 45 females who have from some abdominal disease destroyed themselves (I take abdominal diseases, because it is under this head that such maladies, if induced by hard labour and over-work, would fall), 27 only have committed suicide at or under 30 years of age; and, as I have already mentioned, woman is in a degree more liable to disease than man, and from the early period of womanhood in this country, to the age of 30, she would pass through the most critical phases of her life; and, therefore, it is not surprising that under this class of disease there is, under the age of 30, a greater show than above it. Moreover, Table I. under *Moral Causes*, presents an inexplicable fact, if the above opinions are received, for it shows that out of the *42 females* there exhibited in *perfect health, no less than 26 have destroyed themselves at or under the age of 30 years*. Again, hard work does not of necessity render women liable to disease; for it is a well-known fact that in a savage state they have easy labours—that constant and laborious exertion give to them a hardiness of constitution which exempts them from many of the ills which afflict the indolent and luxurious females of civilized society. It is supposable, therefore, that these almost

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Showing the moral causes which are stated to have induced self-destruction, the ages and sexes, and the Pergunnahs, in which the greatest number of Sui- cides have occurred from 1851 to 1855.

cides																							
Fever.		*Abuse.*			*Adultery.*			*Anger.*			*Grief.*			*Shame.*			*Quarrel.*			Total in each Pergunnah.		General Total.	
M.	F.	A.	M.	F.	A.	M.	F.	A.	M.	F.	A.	M.	F.	A.	M.	F.	A.	M.	F.	M.	F.	M.	F.
...	...	...	...	...	...	...	...	...	...	...	...	...	...	28	1	0	25	0	1	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5	6		
...	...	...	...	...	...	...	...	35	0	1	40	0	1	25	0	1	40	0	1	...	...		
...	...	...	...	...	...	...	...	25	0	1	...	...	...	...	...	1	...	...	...	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
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...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	2	0	0	1	9	18		
...	...	21	1	...	30	0	1	50	0	1	85	1	0	60	0	1	35	0	1	...	...		
...	...	...	...	...	26	0	1	...	...	...	32	0	1	...	...	...	20	0	1	...	...		
...	...	...	...	...	...	...	...	.	...	...	...	...	...	...	...	...	20	0	1	...	...		
...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	20	0	1	...	...		
0	0	0	1	0	0	0	2	0	0	1	0	1	1	0	0	1	0	0	4	9	26		
0	1	50	0	1	...	...	...	18	0	1	20	0	1	22	0	1	45	0	1	...	...		

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children of Nature in Bundelkund enjoy the same immunity, and that they are thus fortified against many of the dangers which arise to those of their own sex in a less rude and more refined state of life.

Table I. shows the pergunnahs in which the greatest number of suicides have occurred.

	M.	F.		
Humeerpore, ...	5	6	85	161
Mondha, ...	2	10		
Jelalpore, ...	9	18		
Rath, ...	9	26		
Punwaree, ...	8	68	76	

Thus, 76 persons have destroyed themselves in Punwaree, and only 85 in the other four pergunnahs. And whether the physical or moral causes be referred to, the same great disproportion is apparent. Of the 45 who have been shown to have destroyed themselves from some abdominal disease, 30 of these committed the act in Punwaree. I know of no local cause by which to explain this fact, unless it is that the people are in a greater state of poverty than in other parts, and are compelled to use such foods as have been spoken of elsewhere as provocative of such maladies.

Moral Causes.

" Abuse."	" Grief."
" Adultery."	" Shame."
" Anger."	" Quarrel."

As shown by Table I., 4 men and 42 females have been urged to self-destruction under this head.

I will illustrate these causes in the following manner:—

Abuse.—A man stopped a woman in the way to her village, and abused her; she forthwith destroyed herself.

Adultery.—A woman forsook her husband and cohabited with another man. When tired of her company her paramour turned her adrift; she destroyed herself.

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Anger.—A woman wished to visit her mother; her husband told her she should do so after four days. Anger at being thwarted urged her to self-destruction.

Grief.—A woman was so grieved at the illness of her child, that she threw it and herself into a well.

Shame.—A woman lent a *bunneeah* Rs. 25; he refused to return the money, on the plea that she was at the time of the loan his mistress; she was so abashed at the falsehood that she straightway destroyed herself.

Quarrel.—A woman fought and quarrelled with a shepherdess, and then destroyed herself.

The above *causes*, as they stand, speak for themselves; they simply illustrate the fact that the rousing any of the passions is a sufficient incentive to self-destruction.

Void as the police records are in matter of detail, they unfold one undoubted fact, that woman is the chief victim.

Woman, to some extent, is more liable to disease than man, but this can only be partially accepted as a reason.

To meet the difficulty, it has been suggested, elsewhere, that woman has an inferior mind, and less of mental firmness than man. But this cannot be allowed. In time of sickness she sustains herself with far greater fortitude than man, and there is no reason to believe other than that she claims an equal superiority to him in all domestic trials and afflictions.

One possesses so little knowledge of the social habits and kindred ties of these people, as to unable him to understand exactly the relations which bear between man and wife; it is, however, well known that the former regards the latter with no very high and ennobled feelings, and how often his ill-usage, neglect, wretched and fatalistic

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apathy, taunting, and bitter invective, are sufficiently exciting causes to urge many a woman to self-destruction, it is impossible to say.

The physical and moral causes which have been mentioned can only be regarded as exciting causes; they appear to me in no wise to explain the *proneness to suicide.* In this country, a person tainted with disease need not of necessity suffer from that disease, until called into action by some exciting cause; so the idiosyncracy of these people lies dormant until aroused.

A hereditary taint is passed on from parent to child. In like manner, also, is this peculiar habit of self-destruction. The habit will continue to develop itself, until some stringent and effective means are used to root it out. Such a tendency, moreover, points to a very low and demoralized condition of the people generally. Even the meanest animal shuns surrounding dangers, and clings to life with pertinacious tenacity; but these people fling it away with the utmost recklessness. Death has no terror to them: they meet it with bold effrontery and stoical indifference.

Lastly, I would observe that *sickness* does not account for the *prevalency of suicide in these parts.* It is only an *exciting cause*; for were it possible to place all the people in Bundelkund in a perfect state of health, all the reports which have been issued on the subject go to prove that the same *tendency* to self-destruction would still prevail.

However, to remove this one *cause* would be a beneficent act. The establishment of institutions for the sick, lunatics, and idiots, must ever confer a benefit upon humanity, and should it be hereafter contemplated to establish a dispensary, or some such institution, between Humeerpore and Mahoba, Punwaree or Rath would be the most central and appropriate position.

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In conclusion, it has occurred to me that if a medical form were drawn up, and placed in the hands of all thannahdars for their guidance at every inquest in all cases of alleged sickness of the body, and friends of the deceased were examined by the medical officer, it would, especially with reference to the *physical causes*, tend considerably to facilitate any future investigation which may be required.

III.—*From* F. O. MAYNE, ESQ., *Magistrate of Banda, to* C. CHESTER, ESQ., *Commissioner of the 4th or Allahabad Division, No. 77 of 1856, dated Banda, the 20th June, 1856.*

I HAVE the honour to acknowledge your Letter No. 546, dated the 29th ultimo, and its enclosure, on the subject of suicide.

2.—As noticed in paragraph 25 of my Police report for 1855, from enquiries made last year, suicides were proved to be certainly not less in number, but perhaps more numerous, in the Banda District than in other parts of Bundelkund. The former Police reports on the subject have been proved to be most untrustworthy. Twenty-one suicides and ten attempts (total 31 cases) are proved to have occurred in 1855; and the attention of the Police not having been fully gained to the point until nearly half the year was over, I find that only 9 out of the 31 cases occurred in the first five months, leaving 22 cases in only seven months; and I think, that very probably, a few cases have still escaped record, and the real number of suicides is even still larger than now represented. I hope for more correct returns this year.

3.—Drowning in wells seems to be the favourite mode of throwing away their lives, and the proportion of the sexes is 19 females to 12 males.

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4.—The immediately exciting or subordinate causes are various, but amongst them *sickness* or disease does *not* predominate: as often as not, there is no discernable reason at all for the act. Only a few days ago, I found an unfortunate woman lying in the road dying of cholera; she was attended by two small children, and had come from a neighbouring village to seek employment on a tank which is being dug in the town. She represented her husband to be a labourer, but he was not with her. She was taken to the dispensary, and the Sub-Assistant Surgeon succeeded in curing her of the cholera. Three days had passed, and she was rapidly recovering strength, when without any apparent reason, and to our great astonishment, she rushed out of the house and threw herself down a well. She was picked out, and died two hours afterwards. On the same day, in another part of the town, a woman, also recovering from cholera, during the absence of her friends, arose, went out, and committed suicide by throwing herself down the nearest well. You cannot account for such acts as these, nor can you directly provide against them.

5.—Such recklessness of life shows a very low state of morality, approaching almost to barbarism; and before we can find a remedy, we must look to the primary cause which has proved a bar to the improvement of these people, and caused so much demoralization of character.

6.—I have no returns which show the condition in life of these self-murderers, but the fact of their chiefly consisting of people of the lower castes would lead to the impression of their also being of the poorer classes. Suicides by the wealthier class of natives seldom or never occur. A party well-to-do in the world, well fed, and well clothed, will naturally have more regard for his life than an unfortunate being reduced by poverty, hunger, and all the ills that make life a burden; and, add

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to this the reason given by Doctor Clarke, that the poorer classes are compelled to use an inferior food, provocative of maladies, which tend to induce these poor ignorant creatures to put an end to their lives as the only available relief from their miseries; and I think we may safely ascribe the primary cause of so many suicides to poverty and distress, past and present. In this district, particularly, I consider such to be a chief cause. The senses blunted, and the powers of the body wearied and exhausted by hard labour, with no one to teach them what is right, they become desperate; cowards by nature, they cannot brave the excessive share of the burden of life which has fallen to their lot, and flying from this world's ills, they boldly plunge into a world unknown. Women, being of the weaker sex, possess less moral courage than the men, and their misery perhaps is often added to by the ill-usage of the latter. Hence they become the most often the victims of the prevailing ignorance, distress, and depression of mind.

7.—To punish these self-murderers for unsuccessful attempts at a crime attributable to such causes would be useless. The only remedy is to try and better the condition of the masses, and to improve their intelligence by a system of indigenous education. For the result we must trust to the course of time.

8.—Compared with the people of the other districts of the North-Western Provinces, I have observed the rural and poorer classes of Bundelkund to be especially rude, ignorant, and unintelligent, and I dare say you may have remarked the same fact. They are but little removed from being brute beasts. They may almost be said to have degenerated to one degree lower than animals, for the latter do possess the one virtue, "love of life;" the former do not. To cure their disease we must add to their mental capacity, and improve their means of sub-

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sistence. A lighter assessment, where such is known to press heavily, *numerous* village schools, branch dispensaries, poorhouses, asylums for the blind and lame, and for those weak of intellect, and such like improvements of civilized life, would do much to raise these unfortunate beings from their present unenlightened and impoverished state; and in proportion as their circumstances improve, and knowledge increases, so may we expect the number of suicides to decrease, and not before.

IV.—*From* G. H. FREELING, ESQ., *Deputy Superintendent of Jaloun, to* C. CHESTER, ESQ., *Commissioner of the Allahabad Division, No. 200 of 1856, dated Oraie, the 23rd June, 1856.*

IN reply to your Letter No. 546, of the 29th May, a copy of which I received yesterday from Mr. Mayne, and the enclosed report of Mr. Clarke on suicide, I am sorry to say, that I have few practical remarks likely to be of use to offer.

Judicial Department.

The real cause of the prevalence of this crime in Hindoostan generally, is so plainly the absence of any of those restraints imposed by religion and belief in a future state, that any decrease is not, I fear, at present to be looked for; and the peculiar frequency of it in the Pergunnahs Rath and Punwaree on one side the Betwa, and Bhandere and Mote on the other, is so entirely unexplained, that it is indeed difficult to suggest a remedy: and here I would note a mistake in Mr. Clarke's report, which, though a very probable one for that officer to make, yet may be worth remarking on, as it might cause an erroneous impression. Speaking of the people of Punwaree, he says, "I know of no local cause by which to explain the fact (of 30 out of 45 of the suicides resulting from

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abdominal diseases taking place in that pergunnah), unless it is that the people are in a greater state of poverty here than in other parts, and are compelled to use such food as provoke such maladies." But it is a notorious fact to all officers who have had any thing to do with Humeerpore, that from a variety of causes, which have no concern with the present matter, Punwaree is by far the lightest assessed pergunnah in the whole district, and the people there are much more comfortable and better off than their neighbours; and, curiously enough, Rath, which shows the next greatest number of suicides, is also the next best off in this respect.

I had myself, when at Humeerpore, commenced a systematic line of punishment against all who were not killed in their attempts at self-destruction, but it requires the system to be pursued steadily for a long course of years, ere any decided effects of the plan could be seen.

It might be objected that certainty of punishment on event of escape would make the unfortunate more determined to accomplish their end effectually, but I think myself, and the native gentlemen I have consulted on the point agree also, that the real cause generally being anger, whatever else the relatives and zemindars may enter it, so as to escape annoyance, and a wish to lay the charge of blood, "*huttiah,*" at their opponent's door, few would not willingly save themselves when in the water (the means almost invariably employed) if such were possible.

The same gentlemen, also, without being aware of my ideas on the subject, stated that in their opinion punishment would deter many from so doing.

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V.—*From* C. B. THORNHILL, ESQ., *Officiating Secretary to Government, North-Western Provinces, to* C. CHESTER, ESQ., *Commissioner of the 4th or Allahabad Division, No. 1167A. of 1856, dated Head-quarters, the 26th July, 1856.*

Judicial Department.

I am directed to acknowledge the receipt of your Letter No. 702, dated the 7th instant, with enclosures, being reports from Messrs. Mayne and Freeling, on the prevalence of suicide in Zillah Humeerpore, and in reply to communicate the following observations:—

2.—The Lieutenant-Governor observes, that as only a commencement has been made in any close and exact course of enquiries on this obscure subject, no definite scheme of measures can at present be attempted for the suppression of the evil; but that the general tenor of the views stated by Mr. Mayne, which could point to the bringing about a better state of feeling by the gradual influence of social improvements, prosecuted in a spirit of sympathy and kindness, and aided by a well-directed charity, is that which deserves the encouragement and support of public authority.

3.—Particular attention ought to be given by the officers in charge of districts, through the responsible agency of the Tehseeldars, to every well-authenticated case of attempt at suicide; the causes should be accurately ascertained and carefully registered; and means taken to secure such medical or other relief as the circumstances may call for and admit. Where anger, arising out of family or personal dissensions, has been the exciting motive, the good influence of neighbours should be appealed to, and the community should be led to look on the act as one that carries with it a stigma of merited discredit and shame. Penal infliction should be reserved for cases of hardened and reckless feeling, such as it may be believed will be of but rare occurrence.

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4.—The suggestion in paragraph 8 of your letter of April 26th, for a careful examination of the bodies, in all instances in which suicide is said to have been committed from disease, is approved and authorized.

5.—The Assistant-Surgeon should carry out his investigations in a deliberate and satisfactory manner during the next cold weather. The Lieutenant-Governor will be prepared to sanction every aid and facility which you may see ground to recommend for the purpose. Attention will be given to the remarks in the second paragraph of Mr. Freeling's letter as to the two pergunnahs of Punwaree and Rath, in Zillah Humeerpore, in which there has been the greatest number of recorded suicides. He states that "Punwaree is by far the lightest assessed pergunnah in the whole district, and the people are there much more comfortable and better off than their neighbours; and, curiously enough, Rath, which shows the next greatest number of suicides, is also the next best off in this respect."

6.—Mr. Mayne has discovered that the reports of the numbers of suicides committed in the Banda District have hitherto been extremely untrustworthy.

7.—The Lieutenant-Governor will willingly recommend the establishment of branch dispensaries at places where, upon mature information, a special need for them may be found to exist.

8.—The Assistant-Surgeon will extend his investigations both into Banda and into the bordering pergunnahs of the Jaloun or Jhansie District.

9.—A copy of the present correspondence will be published in an early number of the Government Selections, in continuation of the former papers on the subject.

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TEA PLANTATIONS.

No. 1.

REPORT UPON THE PLANTATIONS IN THE NORTH-WESTERN PROVINCES.

REPORT *upon the Tea Plantations of Dehra, Kumaon, and Gurhwal, by* ROBERT FORTUNE, ESQ., *addressed to* JOHN THORNTON, ESQ., *Secretary to the Government, North-Western Provinces, dated Calcutta, September 6th, 1851.*

SIR,—Having inspected the whole of the Government and Zemindaree tea plantations in Gurhwal and Kumaon, in compliance with the orders of the Honorable the Lieutenant-Governor, North-Western Provinces, sanctioned by the Most Noble the Governor-General of India, I have now the honour to transmit my report upon the condition of these plantations, and upon the future prospects of tea cultivation in the Himalayas. I have also suggested some improvements in the cultivation and manufacture, which I have been able to do from experience gained during a long residence in China, and which I believe to be of great importance.

I have, &c.,
ROBT. FORTUNE.

REPORT UPON THE TEA PLANTATIONS IN THE NORTH-WESTERN PROVINCES.

KAOLAGIR TEA PLANTATION.

1. *Situation and Extent.*—The Dehra Dhoon, or valley of Dehra, is situated in latitude 30° 18′ north, and in longitude 78° east. It is about 60 miles in length from east to west, and 16 miles broad at its widest part. It is bounded on the south by the Sewalik range of hills, and on the north

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by the Himalayas proper, which are here nearly 8,000 feet above the level of the sea. On the west it is open to the river Jumna, and on the east to the Ganges, the distance between these rivers being about 60 miles.

In the centre of this flat valley, the Kaolagir tea plantation has been formed. Eight acres were under cultivation in 1847. There are now 300 acres planted, and about 90 more taken in and ready for many thousands of young plants, raised lately from seeds in the plantation.

2. *Soil and Culture.*—The soil of this plantation is composed of clay, sand, and vegetable matter, rather stiff and apt to get " baked" in dry weather, but free enough when it is moist, or during the rains. It rests upon a gravelly subsoil, consisting of limestone, sandstone, clay-slate, and quartz rock, or of such rocks as enter into the composition of the surrounding mountain ranges. The surface is comparatively *flat*, although it falls in certain directions towards the ravines and rivers.

The plants are arranged neatly in rows 5 feet apart, and each plant is about 4½ feet from its neighbour in the row. A long rank-growing species of grass indigenous to the Dhoon, is most difficult to keep from overtopping the tea plants, and is the cause of much extra labour. Besides the labour common to all tea countries in China, such as weeding, and occasionally loosening the soil, there is here an extensive system of irrigation carried on. To facilitate this, the plants are planted in trenches, from four to six inches below the level of the ground, and the soil thus dug out is thrown between the rows to form the paths. Hence the whole of the plantation consists of numerous trenches of this depth, and five feet from centre to centre. At right angles with these trenches a small stream is led from the canal; and by opening or shutting their ends, irrigation can be carried on at the pleasure of the overseer.

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3. *Appearance and Health of Plants.*—The plants generally did not appear to me to be in that fresh and vigorous condition which I had been accustomed to see in good Chinese plantations. This, in my opinion, is caused—1st, by the plantation being formed on *flat land*; 2nd, by the system of *irrigation;* 3rd, by too early plucking; and 4th, by hot drying winds, which are not unfrequent in this valley from April to the beginning of June.

GUDDOWLEE PLANTATION (NEAR PAOREE).

1. *Situation and Extent.*—This plantation is situated in the Province of Eastern Gurhwal, in latitude 30° 8′ north, and in longitude 78° 45′ east. It consists of a large tract of terraced land, extending from the bottom of a valley or ravine to more than 1,000 feet up the sides of the mountain. Its lowest portion is about 4,300 feet, and its highest 5,300 feet above the level of the sea: the surrounding mountains appear to be from 7,000 to 8,000. The plantation has not been measured, but there are, apparently, fully one hundred acres under cultivation.

There are about 5,00,000 plants already planted, besides a large number of seedlings in beds ready for transplanting. About 3,400 of the former were planted in 1844, and are now in full bearing; the greater portion of the others are much younger, having been planted out only one, two, and three years.

2. *Soil and Culture.*—The soil consists of a mixture of loam, sand, and vegetable matter, is of a yellow colour, and is most suitable for the cultivation of the tea plant. It resembles greatly the soil of the best tea districts in China. A considerable quantity of stones are mixed with it, chiefly small pieces of clay-slate, of which the mountains here are composed. Large tracts of equally good land, at present covered with jungle, are available in this district,

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without interfering in any way with the rights of the settlers.

I have stated that this plantation is formed on the hill-side. It consists of a succession of terraces, from the bottom to the top, on which the tea bushes are planted. In its general features it is very like a Chinese tea plantation, although one rarely sees tea lands terraced in China. This, however, may be necessary in the Himalayas, where the rains fall so heavily. Here, too, the system of irrigation is carried on, although to a small extent only, owing to the scarcity of water during the dry season.

3. *Appearance and Health of Plants.*—This plantation is a most promising one, and I have no doubt will be very valuable in a few years. The plants are growing admirably, and evidently like their situation. Some of them are suffering slightly from the effects of hard plucking, like those at Kaolagir; but this can easily be avoided in their future management. Altogether, it is in a most satisfactory condition, and shows how safe it is in matters of this kind to follow the example of the Chinese cultivator, who never makes his tea plantations on *low rice land,* and *never irrigates.*

HAWULBAUGH PLANTATION (NEAR ALMORAH).

1. *Situation and Extent.*—This tea farm is situated on the banks of the river Kosilla, about 6 miles north-west from Almorah, the capital of Kumaon. It is about 4,500 feet above the level of the sea. The land is of an undulating character, consisting of gentle slopes and terraces, and reminded me of some of the best tea districts in China. Indeed, the hills themselves, in this part of the Himalayas, are very much like those of China, being barren near their summits and fertile on their lower sides.

Thirty-four acres of land are under tea cultivation here, including the adjoining farm of Chullar. Some of the plants

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appear to have been planted in 1844; but, as at Paorce, the greater number are only from one to three years old.

2. *Soil and Culture.*—The soil is what is usually called a sandy loam; it is moderately rich, being well mixed with vegetable matter. It is well suited for tea cultivation. The greater part of the farm is terraced as at Guddowlee, but some few patches are left in natural slopes, in accordance with the Chinese method. Irrigation is practised to a limited extent.

3. *Appearance and Health of Plants.*—All the young plants here are in robust health and are growing well, particularly where they are growing on land where water cannot flood or injure them. As examples of this, I may point out a long belt between Dr. Jameson's house and the flower-garden, and also a piece of ground a little below the houses in which the Chinese manufacturers live. Some few of the older bushes appear rather stunted; but this is evidently the result of water remaining stagnant about their roots, and partly also of over-plucking; both defects, however, admit of being easily cured.

Lutchmisser and Kuppeena Plantations.

1. *Situation and Extent.*—These plantations are on the hill-side near Almorah, and about 5,000 feet above the level of the sea. The situation is somewhat steep, but well adapted to the growth of tea. The former contains three acres and the latter four acres, under cultivation.

2. *Soil and Culture.*—The soil is light and sandy, and much mixed with particles of clay-slate, which have crumbled down from the adjoining rocks. I believe these plantations are rarely irrigated, and the land is steep enough to prevent any stagnant water from remaining about the roots of the plants.

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3. *Appearance and Health of Plants.*—Most of the bushes here are fully grown and in full bearing, and generally in good health. On the whole, I consider these plantations to be in excellent order.

BHEEMTAL PLANTATIONS.

The lake of Bheemtal is situated in latitude 29° 20′ north, and in longitude 79° 30′ east. It is 4,000 feet above the level of the sea, and some of the surrounding mountains are said to be 8,000 feet. These form the southern chain of the Himalayas, and bound the vast plain of India, of which a glimpse can be had through the mountain passes. Amongst these hills there are several *tals* or lakes, some flat meadow-looking land, and gentle undulating slopes, while higher up we have steep and rugged mountains. It is amongst these hills that the Bheemtal tea plantations have been formed. They may be classed under three heads, *viz*:—

1. *Anoo and Kooasur Plantations.*—These adjoin each other, are both formed on *low flat land,* and together cover about 46 acres. The plants do not seem healthy or vigorous; many of them have died out, and few are in that state which tea plants ought to be in. Such situations never ought to be chosen for tea cultivation. The same objection applies to these as to those at Dehra, but in a greater degree. No doubt, with sufficient drainage, and great care in cultivation, the tea plant might be made to exist in such a situation; but I am convinced it would never grow with that luxuriance which is necessary in order to render it a profitable crop. *Besides, such lands are valuable for other purposes.* They are excellent rice lands, and as such of considerable value to the natives.

2. *Bhurtpore Plantation.*—This plantation covers about 4¼ acres of terraced land on the hill-side, a little to the eastward of those last noticed. The soil is composed

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of a light loam, much mixed with small pieces of clay-slate and trap or green-stone, of which the adjacent rocks are composed. It contains also a small portion of vegetable matter or *humus.* Both the situation and soil of this plantation are well-adapted to the requirements of the tea shrub, and consequently we find it succeeding here as wèll as at Guddowlee, Hawulbâgh, Almorah, and other places where it is planted on the slopes of the hills.

3.—*Russia Plantation.*—This plantation extends over 75 acres, and is formed on sloping land. The elevation is somewhat less than Bhurtpore, and although terraced in the same way, the angle is much lower. In some parts of the farm the plants are doing well, but generally they seemed to be suffering from too much water and hard plucking. I have no doubt, however, of the success of this farm, when the system of cultivation is improved. I observed some most vigorous and healthy bushes in the overseer's garden—a spot adjoining the plantation, which could not be irrigated, and was informed they "never received any water, except that which fell from the skies."

In the Bheemtal District, there are large tracts of excellent tea land. In crossing over the hills towards Nynee Tal, with J. H. Batten, Esq., Commissioner of Kumaon, I pointed out many tracts admirably adapted for tea cultivation, and of no great value to the natives; generally, those lands on which the *mundooa* is cultivated are the most suitable.

I have thus described all the Government plantations in Gurhwal and Kumaon. Dr. Jameson, the Superintendent, deserves the highest praise for the energy and perseverance with which he has conducted his operations. I shall now notice the plantations of the zemindars, under the superintendence of the Commissioner and Assistant Commissioner of Kumaon and Gurhwal.

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Zemindaree Tea Plantations.

1st, at Lohba.—This place is situated in Eastern Gurhwal, about 50 miles to the westward of Almorah, and is at an elevation of 5,000 feet above the level of the sea. It is one of the most beautiful spots in this part of the Himalayas. The surrounding mountains are high, and in some parts precipitous, while in others they are found consisting of gentle slopes and undulations. On these undulating slopes, there is a great deal of excellent land suitable for tea cultivation. A few tea bushes have been growing vigorously for some years in the Commissioner's garden, and they are now fully ten feet in height. These plants having succeeded so well, naturally induced the authorities of the province to try this cultivation upon a more extensive scale. It appears that in 1844, about 4,000 young plants were obtained from the Government plantations, and planted on a tract of excellent land, which the natives wished to abandon. Instead of allowing the people to throw up their land, they were promised it rent-free, upon the condition that they attended to the cultivation of the tea, which had been planted on a small portion of the ground attached to the village.

This arrangement seems to have failed, either from want of knowledge or from design, or perhaps partly from both of these causes. More lately, a larger number of plants have been planted, but I regret to say with nearly the same results.

But results of this discouraging kind are what any one accquainted with the nature of the tea plant could have easily foretold, had the treatment intended to be given it been explained to him. Upon enquiry, I found the villagers had been managing the tea lands just as they had been doing their rice fields; that is, a regular system of irrigation was practised. *As water was plentiful*, a great

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number, indeed nearly all, the plants seem to have perished from this cause. The last planting alluded to had been done late in the spring, and just at the commencement of the dry weather, and to these plants little or no water seems to have been given. So that in fact it was going from one extreme to another equally bad, and the result was of course nearly the same.

I have no hesitation in saying that the district in question is well adapted for the cultivation of tea. With judicious management, a most productive farm might be established here in four or five years. Land is plentiful, and of little value either to the natives or the Government.

2nd, at Kutoor.—This is the name of a large district 30 or 40 miles northward from Almorah, in the centre of which the old town or village of Byznath stands. It is a fine undulating country, consisting of wide valleys, gentle slopes, and little hills, while the whole is intersected by numerous streams, and surrounded by high mountains. The soil of this extensive district is most fertile, and is capable of producing large crops of rice on the low irrigable lands, and the dry grains and tea on the sides of the hills. From some cause, however, either the thinness of population or *the want of a remunerative crop*,* large tracts of this fertile district have been allowed to go out of cultivation. Everywhere I observed ruinous and jungle-covered terraces, which told of the more extended cultivation of former years.

Amongst some hills near the upper portion of this district, two small tea plantations have been formed under the patronage and superintendence of Captain Ramsay,

* The crops of this district, such as rice, *mundooa*, and other grains, are so plentiful and cheap, as scarcely to pay the carriage to the nearest market-town, much less to the plains. In Almorah, a maund of rice or *mundooa* sells for something less than a rupee, barley for eight annas, and wheat for a rupee.

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Senior Assistant Commissioner of Kumaon. Each of them cover three or four acres of land, and had been planted about a year before the time of my visit. In this short space of time, the plants had grown into nice strong bushes, and were in the highest state of health. I never saw, even in the most favoured districts in China, any plantations looking better than these. This result, Captain Ramsay informed me, had been attained in the following simple manner. All the land attached to the two villages with which the tea farms are connected is exempted from the revenue tax—a sum amounting only to Rs. 52 per annum. In lieu of this, the *asamees* (cultivators) of both villages assist with manure and at the transplanting season, as well as ploughing and preparing fresh land. In addition to this, one chowdree and four prisoners are constantly employed upon the plantations. The chief reason of the success of these plantations, next to that of the land being well suited for tea cultivation, may, no doubt, be traced to a good system of management; that is, the young plants have been carefully transplanted at the proper season of the year, when the air was charged with moisture, and they have not been destroyed by excessive irrigation afterwards. The other zemindaree plantation at Lohba might have been now in full bearing had the same system been followed.

From the description thus given, it will be observed that I consider the Kutoor plantations in a most flourishing condition. And I have no doubt they will continue to flourish, and soon convince the zemindars of the value of tea cultivation, providing three things intimately connected with the success of the crop are strongly impressed upon their minds; *viz.*, the unsuitableness of low wet lands for tea cultivation; the folly of irrigating tea as they would do rice; and the impropriety of commencing the plucking before the plants are strong and of considerable

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size. It is difficult in a report to give an idea of the proper time to begin plucking, but I have explained my views upon the subject fully to Dr. Jameson and to Captain Ramsay. I am happy to add that amongst these hills there are no foolish prejudices in the minds of the natives against the cultivation of tea. About the time of my visit a zemindar came and begged two thousand plants to enable him to commence tea-growing on his own account.

It is of great importance, that the authorities of a district and persons of influence, should show an interest in a subject of this kind. At present the natives do not know its value, but they are as docile as children, and will enter willingly upon tea cultivation providing the "*sahib*" shows that he is interested in it. In a few years the profits received will be a sufficient inducement.

In concluding this part of my report, I beg to suggest the propriety of obtaining some of the *best varieties* of the tea plant which have been introduced lately into the Government plantations from China. Dr. Jameson could, no doubt, spare a few, but they ought to be given to those zemindars only who have succeeded with the original variety.

Having described in detail the various Government plantations, and also those of the zemindars which came under my notice in the Himalayas, I shall now make some general remarks upon the cultivation of tea in India, and offer some suggestions for its improvement.

General Remarks.

1. *On Land and Cultivation.*—From the observations already made upon the various tea farms which I have visited in the Himalayas, it will be seen that I do not approve of *low flat lands* being selected for the cultivation of the tea shrub. In China, which at present must be regarded as the model tea country, the plantations are never made in

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such situations, or they are so rare as not to have come under my notice. In that country they are usually formed on the lower slopes of the hills; that is, in such situations as those at Guddowlee, Hawulbâgh, Almorah, Kutoor, &c., in the Himalayas. It is true that in the fine green tea country of Hwuychow, in China, near the town of Tun-che, many hundred acres of flattish land are under tea cultivation. But this land is close to the hills, which jut out into it in all directions, and it is intersected by a river whose banks are usually from 15 to 20 feet above the level of the stream itself, not unlike those of the Ganges below Benares. In fact, it has all the advantages of hilly land such as the tea plant delights in. In extending the Himalaya plantation, this important fact ought to be kept in view.

There is no scarcity of such land in these mountains, more particularly in Eastern Gurhwal and Kumaon. It abounds in the districts of Paorie, Kunour, Lohba, Almorah, Kutoor, and Bheemtal, and I was informed by Mr. Batten that there are large tracts about Gungolee, and various other places equally suitable. Much of this land is out of cultivation, as I have already stated, while the cultivated portions yield on an average only two or three annas per acre of revenue.

Such lands are of less value to the zemindars than low rice land, where they can command a good supply of water for irrigation. But I must not be understood to recommend poor worn-out hill lands for tea cultivation—land on which nothing else will grow. Nothing is further from my meaning. Tea, in order to be profitable, requires a good sound soil; a light loam, well mixed with sand and vegetable matter, moderately moist, and yet not stagnant nor sour. Such a soil, for example, as on these hill-sides produces good crops of *mundooa*, wheat, or millet, is well adapted

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for tea. It is such lands which I have alluded to as abounding in the Himalayas, and which are, at present, of so little value either to the Government or to the natives themselves.

The *system of irrigation* applied to tea in India is never practised in China. I did not observe it practised in any of the great tea countries which I visited. On asking the Chinese manufacturers whom I brought round, and who had been born and brought up in these districts, whether they had seen such a practice, they all replied: *"No, that is the way we grow rice; we never irrigate tea."* Indeed, I have no hesitation in saying, that in nine cases out of ten, the effects of irrigation are most injurious. When tea will not grow without irrigation, it is a sure sign that the land employed is not suitable for such a crop. It is no doubt an excellent thing to have a command of water in case of a long drought, when its agency might be useful in saving a crop which would otherwise fail, but irrigation ought to be used only in such emergent cases.

I have already observed that good tea land is naturally moist, although not stagnant; and we must bear in mind that the tea shrub is *not a water plant,* but is found in a wild state on the sides of hills. In confirmation of these views, it is only necessary to observe further, that all the *best Himalayan plantations are those to which irrigation has been most sparingly applied.*

In cultivating the tea shrub, much injury is often done to a plantation by *plucking leaves from very young plants.* In China young plants are never touched until the third or fourth year after they have been planted. If growing under favourable circumstances, they will yield a good crop after that time. All that ought to be done, in the way of plucking or pruning, before that time, should be done with a view to *form the plants,* and make them *bushy,* if they do

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not grow so naturally. If plucking is commenced too early, and continued, the energies of the plants are weakened, they are long in attaining any size, and consequently there is a great loss of produce in a given number of years. To make this more plain, I will suppose a bush that has been properly treated to be eight years of age. It may then be yielding from two to three pounds of tea per annum, while another of the same age, but not a quarter of the size, from over-plucking, is not giving more than as many ounces.

The same remarks apply also to plants which become unhealthy from any cause; leaves ought never to be taken from such plants, the gatherers should have strict orders to pass them over until they get again into a *good state* of health.

2. *On Climate.*—I have already stated that Eastern Gurhwal and Kumaon appear to me to be the most suitable for the cultivation of the tea plant in this part of the Himalayas. My remarks upon climate will therefore refer to this part of the country.

From a table of temperature kept at Hawulbâgh, from November 28th, 1850, to July 13th, 1851, obligingly furnished me by Dr. Jameson, I observe that the climate here is extremely mild. During the winter months, the thermometer (Fahr) at sunrise was never lower than 44°, and only on two occasions so low,—namely on the 15th and 16th of February, 1851. Once it stood as high as 66°, on the morning of February the 4th; but this is full 10° higher than usual. The minimum in February must, however, be several degrees lower than is shown by this table, for ice and snow are not unfrequent; indeed, opposite the 16th of February, in the column of remarks, I find written down "*a very frosty morning.*" This discrepancy no doubt arises either from a bad thermometer being used, or from

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its being placed in a sheltered verandah. We may, therefore, safely mark the minimum as 32° instead of 44°.

The month of June appears to be the hottest in the year. I observe the thermometer on the 5th, 6th, and 7th of that month, stood at 92° at 3 P. M., and this was the highest degree marked during the year. The lowest, at this hour, during the month, was 76°; but the general range in the 3 P. M. column of the table is from 80° to 90°.

The *wet and dry seasons* are not so decided in the hills as they are in the plains. In January, 1851, it rained on five days and ten nights, and the total quantity of rain which fell, as indicated by the rain-guage, during this month, was 5·25 inches; in February, 3·84 fell; in March, 2·11; in April, 2·24; in May, none; and in June, 6·13. In June, there are generally some days of heavy rain, called by the natives *chota bursât*, or small rains; after this, there is an interval of some days of dry weather before the regular "rainy season" commences. This season comes on in July, and continues until September. October and November are said to be beautiful months, with a clear atmosphere and cloudless sky. After this, fogs are frequent in all the valleys until spring.

In comparing the climate of these provinces with that of China, although we find some important differences, yet upon the whole there is a great similarity. My comparisons apply, of course, to the best tea districts only, for although the tea shrub is found cultivated from Canton in the south to Tan-chow-poo in Shan-tung, yet the provinces of Fokein, Kiansee, and the southern parts of Kiangnan yield nearly all the finest teas of commerce.

The town of Tsong-gan, one of the great black tea towns near the far-famed Woo-eshan, is situated in latitude 27° 47′ north. Here the thermometer, in the hottest months—

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namely, in July and August—rarely rises above 100°, and ranges from 92° to 100° as maximum; while in the coldest months, December and January, it sinks to the freezing point, and sometimes a few degrees lower. We have thus a close resemblance in temperature between Woo-eshan and Almorah. The great green tea district being situated two degrees further north, the extremes of temperature are somewhat greater. It will be observed, however, that while the hottest month in the Himalayas is June, in China the highest temperature occurs in July and August; this is owing to the rainy season taking place earlier in China than it does in India.

In China, rain falls in heavy and copious showers in the end of April, and these rains continue at intervals in May and June. The first gathering of tea-leaves—those from which the Pekoe is made—is scarcely over, before the air becomes charged with moisture, rain falls, and the bushes being thus placed in such favourable circumstances for vegetating, are soon covered again with young leaves, from which the main crop of the season is obtained.

No one acquainted with vegetable physiology, can doubt the advantages of such weather in the cultivation of tea for mercantile purposes. And these advantages, to a certain extent at least, seem to be extended to the Himalayas, although the regular rainy season is later than in China. I have already shown, from Dr. Jameson's table, that spring showers are frequent in Kumaon, although rare in the plains of India; still, however, I think it would be prudent to adapt the gathering of leaves to the climate; that is, to take a moderate portion from the bushes before the rains, and the main crop after they have commenced.

3. *On the Vegetation of China and the Himalayas.*—One of the surest guides from which to draw conclusions, on a subject of this nature, is found in the indigenous vegetable

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productions of the countries. Dr. Royle, who was the first to recommend the cultivation of tea in the Himalayas, drew his conclusions—in the absence of that positive information from China which we possess now—not only from the great similarity in temperature between China and these hills, but also from the resemblance in vegetable productions. This resemblance is certainly very striking. In both countries, except in the low valleys of the Himalayas (and these we are not considering), tropical forms are rarely met with. If we take trees and shrubs, for example, we find such genera as *pinus*, cypress, *berberis*, *quercus*, *viburnam*, *indigofera*, *andromeda*, *lonicera*, *deutzia*, *rubus*, *myrica*, *spiræa*, ilex, and many others common to both countries.

Amongst herbaceous plants we have *gentiana*, *aquilegia*, anemone, *rumex*, *primula*, *lilium*, *leoutodon*, ranunculus, &c., equally distributed in the Himalayas and in China, and even in aquatics the same resemblance may be traced, as in *nelumbium*, *caladium*, &c. And further than this, we do not find plants belonging to the same genera only, but in many instances the identical species are found in both countries. The *indigofera*, common in the Himalayas, abounds also on the tea hills of China, and so does *berberis nepaulencis*, *lonicera diversifolia*, *myrica sapida*,* and many others.

Were it necessary, I might now show that there is a most striking resemblance between the geology of the two countries, as well as in their vegetable productions. In both the black and green tea countries which I have alluded

* The Chinese have a fine variety of this fruit, which ought by all means to be introduced to the Himalayas. It is as large as an Orleans plum, and as superior to the Indian one as the apple is to the crab. It would be a great luxury to the poor. *Grafted plants* must be procured.

The variety of the bamboo, common about temples on the tea hills of China, would also be of much value in India, where there is nothing to be compared to them.

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to, clay-slate is most abundant. But enough has been advanced to prove how well many parts of the Himalayas are adapted for the cultivation of tea; besides, the flourishing condition of many of the plantations is, after all, the best proof, and puts the matter beyond all doubt.

4. *Concluding Suggestions.*—Having shown that tea can be grown in the Himalayas, and that it would produce a valuable and remunerative crop, the next great object appears to be the production of superior tea, by means of fine varieties and improved cultivation. It was well known that a variety of the tea plant existed in the southern parts of China, from which inferior teas only were made. That, being more easily procured than the fine northern varieties, from which the great mass of the best teas are made, was the variety originally sent to India. From it all those in the Government plantations have sprung.

It was to remedy this, and to obtain the best varieties from those districts which furnish the trees of commerce, that induced the Honorable Court of Directors to send me to China in 1848. Another object was to obtain some good manufacturers and implements from the same districts. As the result of this mission, nearly twenty thousand plants from the best black and green tea countries of central China have been introduced to the Himalayas. Six first-rate manufacturers, two head-men, and a large supply of implements from the celebrated Hwüychow districts, were also brought round, and safely located on the Government plantations in the hills.

A great step has thus been gained towards the objects in view. Much, however, remains still to be done. The new China plants ought to be carefully propagated and distributed over all the plantations; some of them ought also to be given to the zemindars; and more of these fine varieties might be yearly imported from China.

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The Chinese manufacturers, who were obtained some years since from Calcutta or Assam, are, in my opinion, far from being first-rate workmen ; indeed, I doubt much if any of them learned their trade in China. They ought to be gradually got rid of, and their places supplied by better men, for it is a great pity to teach the natives an inferior method of manipulation. The men brought round by me are first-rate green tea-makers ; they can also make black tea, but they have not been in the habit of making so much black as green. They have none of the Canton illiberality or prejudices about them, and are most willing to teach their art to the natives. I have no doubt some of the latter will soon be made excellent tea manufacturers. And the instruction of the natives is, no doubt, one of the chief objects which ought to be kept in view, for the importation of Chinese manipulators at high wages can only be regarded as a temporary measure : ultimately, the Himalayan tea must be made by the natives themselves ; each native farmer must learn how to make tea as well as how to grow it ; he will then make it upon his own premises, as the Chinese do ; and the expenses of carriage will be much less than if the green leaves had to be taken to the market.

But as the zemindars will be able to grow tea long before they are able to make it, it would be prudent in the first instance to offer them a certain sum for green leaves brought to the Government manufactory.

I have pointed out the land most suitable for the cultivation of tea, and shown that such land exists in the Himalayas to an almost unlimited extent. But if the object the Government has in view be the establishment of a company to develop the resources of these hills, as in Assam, I would strongly urge the propriety of concentrating, as much as possible, the various plantations. Sites

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ought to be chosen which are not too far apart, easy of access, and, if possible, near rivers; for, no doubt, a considerable portion of the produce would have to be conveyed to the plains or to a sea-port.

In my tour amongst the hills, I have seen no place so well adapted for a central situation as Almorah or Hawulbâgh. Here the Government has already a large establishment, and tea lands are abundant in all directions. The climate is healthy, and better suited to an European constitution than most other parts of India. Here plants from nearly all the temperate parts of the world are growing as if they were at home. As examples, I may mention myrtles, pomegranates, and tube-roses, from the south of Europe; dahlias, potatoes, aloes, and yuccas from America; *melianthus major* and bulbs from the Cape; the cypress and deodar of the Himalayas; and the *lagerstrœmias, loquats*, roses, and tea, of China.

In these days, when tea has become almost a necessary of life to England and her wide-spreading colonies, its production upon a large and cheap scale is an object of no ordinary importance. But to the natives of India themselves, the production of this article would be of the greatest value. The poor *puhuree*, or hill-farmer, at present has scarcely the common necessaries of life, and certainly none of its luxuries. The common sorts of grain which his lands produce will scarcely pay the carriage to the nearest market-town, far less yield a profit of such a kind as will enable him to purchase some few of the necessary and simple luxuries of life. A common blanket has to serve him for his covering by day and for his bed at night, while his dwelling-house is a mere mud hut, capable of affording but little shelter from the inclemency of the weather. Were part of these lands producing tea, he would then have a healthy beverage to drink, besides a commodity which

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would be of great value in the market. Being of small bulk compared with its value, the expense of carriage would be trifling, and he would return home with the means in his pocket of making himself and his family more comfortable and more happy.

Were such results doubtful, we have only to look across the frontiers of India into China. Here we find tea one of the necessaries of life, in the strictest sense of the word. A Chinese never drinks cold water, which he abhors, and considers unhealthy. Tea is his favourite beverage from morning until night; not what we call tea, mixed with milk and sugar, but the essence of the herb itself drawn out in pure water. One acquainted with the habits of this people can scarcely conceive the idea of the Chinese empire existing were it deprived of the tea plant; and I am sure that the extensive use of this beverage adds much to the health and comfort of the great body of the people.

The people of India are not unlike the Chinese in many of their habits. The poor of both countries eat sparingly of animal food, and rice, with other grains and vegetables, form the staple articles on which they live; this being the case, it is not at all unlikely the Indian will soon acquire a habit which is so universal in the sister country. But in order to enable him to drink tea, it must be produced at a cheap rate; he cannot afford to pay at the rate of four or six shillings a pound. It must be furnished to him at four *pence* or six *pence* instead, and this can be done easily, but only on his own hills. If this is accomplished, and I see no reason why it should not be, a boon will have been conferred upon the people of India of no common kind, and one which an enlightened and liberal Government may well be proud of conferring on its subjects.

ROBERT FORTUNE.

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No. 2.

GOVERNMENT TEA PLANTATIONS : THE YIELD OF THE FACTORIES, AND THE SUPPORT GIVEN TO PRIVATE CAPITALISTS, WITH SUGGESTIONS FOR THE IMPROVEMENT OF IRRIGATION IN THE DEHRA DHOON.

From Superintendent, Botanical Gardens, to Secretary to Government, North-Western Provinces, No. 285, dated Saharunpore, the 12th May, 1862.

SIR,—I have the honour to lay before you, for the information of the Hon'ble the Lieutenant-Governor, a detailed statement showing the manner in which the Government tea plantations have been worked, and the results obtained during the last season.

2. For some time during the season I was absent from my duties, bad health having compelled me to visit Europe on medical certificate. During my absence my work was actively and energetically conducted by Dr. J. L. Stewart. To him I made over charge on the 1st March, sailed from Calcutta on the 24th March, returned on the 1st November, and resumed my office on the 21st November.

3. The out-turn of tea during the last season shows a decrease on that of the former year, caused by the great drought during the cold weather and months of April and May. The grain crops throughout the upper part of the Doab were a failure. It ought not, therefore, to be a matter of surprise that the yield of tea shows a decrease, particularly as the chief or first crop of leaf almost entirely failed. Considering this, the decrease may be considered small, and showing how admirably the plant is fitted for the Kohistan of the North-Western Provinces and Punjab.

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4. The quantity of tea prepared in the factories was as follows :—

KOWLAGHIR FACTORY, DEHRA DHOON.

Green Teas.

Gunpowder, ...	lbs.	199	0		
Imperial Gunpowder, ...	„	182	0		
Hyson, ...	„	150	0		
Young Hyson, ...	„	386	0		
Hyson Skin, ...	„	817	0		
				1,734	0
Samples sent to Exhibition,	„	...		21	0

Black Teas.

Souchong, ...	lbs.	4,846	0		
Fine Souchong	„	1,853	0		
				6,699	0
Pouchong, ...	„			3,244	0
				3,244	0
Bohea, ...	„	...		3,284	0
Total,	„			14,982	0

PAOREE FACTORY, GURHWAL.

Black Teas.

Souchong, ...	lbs.	2,697	0		
Pouchong, ...	„	2,850	0		
Bohea, ...	„	4,700	0		
				10,247	0

BHEEMTAL FACTORY, KUMAON.

Black Teas.

Souchong, ...	lbs.	1,129	12		
Pouchong, ...	„	64	12		
Bohea, ...	„	75	0		
				1,269	8
Total,	„			26,498	8

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HAWULBAUGH FACTORY, KUMAON.

Green Teas.

Fine Green Tea, ...	lbs.	521	0		
Hyson Skin, ...	„	880	7		
				1,401	7

Black Teas.

Souchong, ...	lbs.	2,707	8		
Bohea, ...	„	2,952	8		
				5,660	0

AYAR TOLI FACTORY, KUMAON.

Souchong, ...	lbs.	7,103	8		
Bohea, ...	„	856	8		
				7,960	0
Total,	„			41,519	15
Showing a Grand Total of lbs.				41,519	15

5. But if there has been a small decrease in the quantity of tea, it has been met by an increase in the produce of seeds, the yield being 2,220 maunds, or 79 tons. Thus—

Kowlaghir Plantation,		... ...	Maunds	860	0
Paoree	do.,	... ...	„	260	0
Ayar Toli	do.,	... ...	„	370	0
Hawul Bâgh	do.,	... ...	„	480	0
Bheemtal,	do.,	... ...	„	250	0
			„	2,220	0

6. Add to this the produce of the Khangra Plantation, Maunds, 1,416 0

„ 3,636 0

and we have an out-turn of 3,636 maunds, or 130 tons.

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7. This immense produce has enabled me to give great assistance to private planters throughout the Kohistan of Kumaon, Gurhwal, Dehra Dhoon, and Punjab, as will be perceived by the appended table, which shows that the large quantity of 2,513 maunds, or 89 tons of seeds, have been distributed gratis to them.

8. In addition to this large quantity of seeds, large numbers of seedling tea plants, amounting to two millions four hundred thousand, have been, or are being, distributed. See *Appendix* B.

9. But though the amount of seeds and plants at my disposal for distribution is immense, it comes far short of the indents received, new parties seeking other fields than those of the Kohistan of the North-Western Provinces and Punjab to carry on tea cultivation. Thus, last season a company established themselves at Hazareebâgh, and to them 15 maunds of seeds were given. To the Neilgherries, too, considerable quantities of seeds have been sent through Dr. Cleghorn, Superintendent of Forests, and by him I have been informed that Her Majesty's Right Hon'ble Secretary of State for India has sanctioned the engagement of some skilled native tea-makers from the Government factories, North-West Provinces, in order to assist tea-planters in the Madras Presidency to prepare tea.

10. Financially, the tea plantations may be thus considered :—

To lbs. 41,519-15 @ Rs. 1-8 per lb.=	Rs.	62,279	14	6
2,200 maunds of seeds, @ Rs. 20 per maund=	„	44,000	0	0
Total,	Rs.	1,06,279	14	6

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To expense of working the plantations, Rs.	48,000	0	0
Balance, „	58,279	14	6
11. To this must be added the value of tea seedlings distributed, *viz.*, 800,000 seedlings @ Rs. 3 per 100= ... Rs.	24,000	0	0
Total balance, Rs.	82,279	14	6

12. Of the teas prepared, lbs. 16,000 are being packed for transmission to London for sale in the London market, and the remainder will be sold by auction at Almorah and Dehra Dhoon, in compliance with the orders of Government. Some delay in packing the teas has occurred, owing to the limited establishment of carpenters, which, however, is being remedied.

13. By private planters, the demand for skilled tea-makers, and native overseers to superintend their factories and plantation operations, is great, and to many—such as Messrs. Dick, Berkeley, Troup, Smith, Knyvett, Mohur Singh, Ram Nath, &c.—skilled native workmen have been given.

14. *Chinese Tea-makers.*—Some of the Chinese tea-makers, whose time of service had expired, have left Government employ and entered that of private parties, being tempted by a much higher rate of pay, and it has been found necessary to give an increase to the remaining tea-makers. This, however, has been done without any increase to the establishment, the increased pay being more than met by that of the men who have resigned.

15. *Apprentices.*—Owing to the small allowance granted to them, the number of apprentices sanctioned by Government has never been quite filled up, and the number now on the establishment is three, two having left for better

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paid appointments. Their services have been found highly useful in the plantations, and could not be dispensed with without detriment to the works going on.

16. *Overseers.*—Owing to the numerous tea companies springing up throughout the Kohistan of the North-West Provinces and Punjab, the demand for experienced European overseers is increasing. The overseer of the Kowlaghir plantation in the Dehra Dhoon has been induced by offer of higher pay to leave Government employ and enter that of a private company. The overseer, too, of Ayar Toli plantation has also left for a more lucrative appointment.

17. To conduct the duties at Kowlaghir in the Dehra Dhoon, I have deputed the Assistant Superintendent of Tea Plantations, Mr. James Thompson, and Mr T. Mooney conducts the duties at Hawulbâgh and Ayar Toli. By both parties the works are carried on actively and efficiently.

18. The Paoree plantation has been made over to Mr. J. Henry from the 1st April, and will form the subject of another communication.

19. To all the tea-planters throughout the Kohistan and valleys of the North-West Provinces I have sent a circular, requesting information as to the quantity of land now brought under cultivation by them, &c., and as soon as I receive replies, I shall lay before you, for the information of the Hon'ble the Lieutenant-Governor, a detailed statement, in order that His Honor may see how the cultivation is spreading.

20. From the Kalee in Kumaon to the Ravee in the Kohistan of the Punjab, the cultivation is being actively and energetically carried on both by European and native capitalists; and the day is not far distant when we may

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expect to see tea exported from the British Himalayas as its staple article of produce, and the hills made lucrative, instead of, as at present, a drag on the revenues of the country.

21. In a few years the Dehra Dhoon, the most attractive spot in the North-West Provinces to the European settler, will become a great tea garden. In every direction in it tea plantations are springing up, and the two things wanted to make them there universal are, in the Eastern Dhoon, drainage, and the Western Dhoon, water for drinking purposes and irrigation. The latter might be made available by *annicuts* being formed near the base of the Himalayas, or at such places where the drainage of the outer Himalayas escapes. It is a fact, that at the very time when water is most wanted from the canals in the Dhoon, *viz.*, in seasons of drought, or even in very dry weather, it can only be obtained in limited quantity. None of the canals have feeders, and depend entirely on the supply of the water in the rivers from whence they take their rise. In the Dehra Dhoon, the want of water in a dryseason is much felt. In the small canals the supply of water dwindles down to a few inches. Were a few reservoirs made, therefore, by forming *annicuts* at the places mentioned, the supply would always be kept up. Even to the great canals, *annicuts* made in the interior of the Himalayas on the courses of the great rivers would be of vast advantage, as by them the full supply of water could always be maintained. That natural *annicuts* existed on the great rivers Ganges, Jumna, &c., at a recent geological period, must be evident to every one who has followed for any distance the courses of these rivers in the interior of the Himalayas; and in our own time, or rather during the last twenty years, on the Indus, two natural *annicuts* have been formed, by the descent of glaciers into the bed of the river, and which has caused it at Attock to be easily ford-

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able. This, however, only remained for a time, as the basis of the *annicuts*, being of a soluble nature, melted and gave way and allowed the waters to escape, carrying with them vast destruction to life and property. The river swept through and over the Chuch valley, levelling every village. At Attock, where it contracts, it rose fifty feet above its usual level, and the towns of Hanshealgurh and Kalabâgh, though built on the banks high above the usual level, were nearly ruined. The river remained fordable at Attock for three months before the catastrophe occurred, pointing out the feasibility of the undertaking were it desirable. To the Dehra Dhoon it would be a great boon, and the one thing needful to enable parties to inhabit waterless tracts in both the Western and Eastern Dhoons. There, too, to form his *annicuts* the Engineer has everything that he requires in abundance; of limestone, sandstone, and and quartz rock, to form his dams, and the best lime available at a cheap rate to form his walls, of any strength, There are no engineering dfficulties to be experienced, as occur on the barren volcanic rock of Aden. But even there, and in a porous rock like lava, reservoirs of vast extent have been made, and in them a supply of water capable of supplying the town with a population of 30,000 for three years is kept.

I have, &c.,

W. JAMESON, *Surgeon-Major,*
Superintendent, Botanical Gardens,
North-Western Provinces.

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No. 3.

DETAILS SHOWING THE MANNER IN WHICH THE TEA FACTORIES AND PLANTATIONS IN THE NORTH-WESTERN PROVINCES HAVE BEEN WORKED DURING THE LAST SEASON, OR FROM APRIL, 1862, TO APRIL, 1863.

By Doctor W. Jameson,
Superintendent, Botanical Gardens, N.-W. P.

I have the honour to submit for the information of His Honor the Lieutenant-Governor, the following details showing the manner in which the tea factories and plantations in the North-West Provinces have been worked during the last season, or from April, 1862, to April, 1863:—

2. During this time the quantity of tea prepared in the factories was—

	fbs.	oz.
Kowlaghir Factory, in the Dehra Dhoon,	18,915	12
Hawulbâgh Factory, in Kumaon, ...	6,241	8
Ayar Toli Factory, do., ...	8,475	8
Bheemtal Factory, do., ...	2,251	0
Total, ...	35,883	12
To this add the yield of the Kangra Plantations, ...	16,125	0
And we have thus an out-turn of ...	52,008	12

3. During the season, the Government plantation at Paoree in Gurhwal has been sold for Rs. 1,00,000, (one lac of Rupees.)

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4. In addition to the tea produced, an enormous quantity of seeds has also been yielded. Thus—

	Mds.	Seers.
Dehra Dhoon Plantations, ...	1,307	0
Hawulbâgh do., ...	970	39
Bheemtal do., ...	135	0
Ayar Toli do., ...	446	33
Total,	2,859	32
Add yield of Kangra Plantations, ...	1,151	0
Total,	4,010	32

or the enormous quantity of 148 tons, 2 cwts., and 10 ℔s.

5. Financially, the result of the working of the tea plantations, North-Western Provinces, may be thus considered—

To ℔s. 35,883-12, at Re. 1-8-0 per ℔,	Rs.	53,826	6	0
" 2,859 maunds of seeds, at Rs. 20 per maund, ...	"	57,180	0	0
Total,	"	1,11,006	6	0
To expense of working the plantations,	"	65,000	0	0
Balance,	"	46,006	6	0
To this must be added the value of the plants distributed gratis to private planters, *viz.*, 7,00,000, at Rs. 3 per 100,...	"	21,000	0	0
Total Balance, ...	"	67,006	6	0

6. All the plantations show an increase on the out-turn of last year, that of the Dehra plantations being,... ... ... lbs. 3,933 4

Of the Hawulbâgh and Ayar Toli Plantations,...	"	689	10
Total,	"	4,622	14
And of the Bhmeetal Plantations,	"	985	9
Total,	"	5,608	7

7. The demand for tea is greatly on the increase, and prices realized at the auctions were fair averages. See *Appendix* .E

8. For the Commissariat, 3,756 lbs. of green tea were made over to the Assistant Commissary-General, Umballa. See *Appendix* D. By natives, the demand is considerable; and by one party, a Cashmeree, by name Ghulam Ghose, lbs. 1,300 were purchased to forward to Bokhara.

9. To the plantations themselves considerable additions have been made, particularly to those of Ayar Toli, where upwards of two hundred acres of waste land have been broken up and planted. All the remaining waste land, too, at Hawulbâgh has also been planted, and at Bheemtal a large tract of jungle has been cut down, cleared, and planted.

10. To private planters great assistance in the form of seeds and plants has been rendered, and during the season the enormous quantity of 2,055 maunds, or 77 tons, and 7,00,000 seedlings, has already been distributed gratis from the plantations, North-Western Provinces, to applicants. See *Appendix* F. But this enormous quantity was very far short of the demand.

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11. To the Madras Government, at the request of Dr. Cleghorn, 24 large packages of tea seeds were forwarded to the Secretary to Revenue Board, Madras, which by him have been sent to the Collectors of Salim, Madura, Tinnivelly, Coimbatoor, Malabar, and Coorg, for distribution to planters.

12. In the cultivation a large amount of capital is now invested, and annually large tracts of jungle land are being broken up and planted with tea; and such is the demand for seeds, that prices demanded by private planters who have plantations, varying from Rs. 20 to Rs. 50 per maund, were readily given for them; and by a sale of seeds to private planters of a portion of the produce of the Government plantations in the Kangra valley the large sum of Rs. 14,030 was realized. This sale, however, was cancelled by His Honor the Lieutenant-Governor of the Punjab, it having been shown that private planters were guaranteed the distribution of seeds and plants gratis so long as the Government plantations were kept up. At Darjeeling, seeds were during the last season selling at the rate of Rs. 120 and Rs. 130 per maund, and in Assam at Rs. 250. This, therefore, shows their value, and the value of the aid yielded by the Government plantations to private planters in their gratis distribution.

13. To many planters, both European and Native, experienced tea cultivators and tea manipulators have been given, and in every tea factory from Kumaon to Kangra men educated in the Government factories are to be found. In every plantation, too, formed by private parties, their head native workmen or chowdrees are found to be men brought up in the Government plantations. But to give this kind of aid, and at the same time to distribute seeds and plants largely, and thus encourage and rapidly extend tea cultivation

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in the Kohistan and Dhoons, are the chief purposes for which the Government plantations are now maintained, and this, I trust, has been done in a most efficient and effectual manner.

14. To Madras, on the requisition of the Madras Government, four experienced native tea-makers have been forwarded from the factory in the Dehra Dhoon to teach the natives in that Presidency how to manipulate tea.

15. To show the extent of the move connected with tea cultivation in the Kohistan of the North-Western Provinces, we shall briefly mention the plantations now in working order, and illustrate the remarks with a map which was prepared in the office of the Surveyor-General of India, Colonel Thuillier, by orders of His Honor the late Lieutenant-Governor.

16. In Eastern Kumaon, at Petoragurh and Lohoo Ghât, Messrs. Lyall and Co. and Messrs. Dansey have formed plantations, and are carrying on their work with vigour and energy. These plantations, near the Kalee river, which separates the British territory from Nepaul proper, are the most eastern ones in the Kohistan of the North-Western Provinces. Proceeding to the westward, *viâ* the military road leading to Almorah, we come to the plantations of Messrs. Wheeler at Julnah, consisting of three hundred acres, of which upwards of one hundred have been planted.

17. In the immediate neighbourhood of Almorah, we meet with numbers of small but fine plantations belonging to different parties—two of them to Government, and the first established nurseries in the Province, and from which all the plantations in the Kohistan have taken their rise.

18. Proceeding north to Hawulbâugh, we find on all sides tea plantations, the largest belonging to Government. Here, too, we find a magnificent plantation yielding large

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quantities of tea, established by the Commissioner, Colonel Ramsay. This plantation, formed chiefly by prison labour, shows how easily the work can be carried on, provided that it receives the necessary attention.

19. Here, too, we find the fine plantations of Chullar, &c., belonging to Government, with its factories, godowns, &c., or a complete and efficient establishment. Surrounding the factory there are plantations of upwards of a hundred acres, covered with fine and luxuriant tea bushes.

20. Proceeding due south from Almorah, and thirty miles distant, we come to the Government plantation of Bheemtal, where the tea plant is growing most luxuriantly. To this plantation great additions have lately been made, which will cause the out-turn this season to be treble that of former years.

21. From Hawulbâugh, 25 miles north, we meet the great plantation belonging to the Kosaine Tea Company, which is being vigorously carried on, and by them large quantities of tea prepared. Descending the ghât at Kosaine we enter the Bijnath valley, and on all sides meet with flourishing tea plantations. This valley is destined to become one of the great centres of tea cultivation in the Himalayas. In it there is the great Government plantation of Ayar Toli, and, adjoining, the plantation of the Bijnath Tea Company, and those of several other parties.

22. Crossing the range of mountains which separates Kumaon from Gurhwal, we come to the flourishing plantation of Messrs. Warrand at Gualdun, which is progressing most favourably. Twenty-five miles north-west from Hawulbâugh we meet with the plantation of Colonel Money, at Donagiree, and at Lobah the plantations of Messrs.

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Richards, and, adjoining, those of Messrs. Barstow and Co., at Silkote.

23. At the head-quarters of the Senior Assistant of Gurhwal, *viz.*, Paoree, we find the fine plantation of Chopra, which was lately sold to Mr. Henry for Rs. 1,00,000.

24. As a great centre for tea cultivation, Paoree is admirably situated, commanding as it does good roads to the plains, *viâ* Tuppubund and Hurdwar, and *viâ* Kotdwarah and Najeebabad.

25. Leaving the Kohistan, and proceeding to the Dehra Dhoon, everywhere we find the tea plant under cultivation, at least in localities where man can live; many other localities there are in this magnificent valley fitted for this kind of cultivation, which, however, owing to its unhealthiness from the want of drainage, as in the Eastern Dhoon, or the entire want of water as in the upper part of the Western Dhoon, cannot be inhabited. But by the tea plant the Dehra Dhoon—which has remained, I may almost say, stationary for the last forty years, no successful attempt having been made to clear its vast waste jungles—is now being regenerated, and a vast stimulus given to farming; and in a few years, if the active and energetic measures now being adopted to bring the valley under cultivation with tea be continued, this magnificent, and until lately neglected spot, will become one of the most important districts of the North-West Provinces.

26. The same remark, too, applies to the Kohistan of the North-West Provinces, which in 1814 was considered by Government as so unprofitable as to be unworthy of retention. Heirs, therefore, to hill lands which had by right of conquest become the possession of Government, were hunted out, and all parties who had been driven from

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their possessions in the Kohistan by the Ghoorkas in 1803 were invited to return and reclaim what belonged to them, though they had not in any way assisted in expelling the invader.

27. A third of these lands is fitted for tea cultivation, and if so cultivated would not only supply the whole of the Indian market with tea, but that of Europe also.

28. In a former communication I estimated the quantity of waste and other lands fitted for cultivation with tea throughout the Kohistan of the North-West Provinces, Punjab, and Dhoons, and showed that by them the enormous quantity of lbs. 88,500,000 might be there raised. But in this estimate I excluded the Kohistan of Huzara and Rawul Pindee, of Cashmere, Jummoo, and the protected Sikh States. The following estimate of the yield of the British territory is more nearly the mark, and, as a general return, when in full bearing, lbs. 100 per acre may be given:—

	Acres.	*lbs. 100 per acre.*
Kohistan of Rawul Pindee and Huzara,	20,000	2,000,000
Kangra valley, ...	35,000	3,500,000
Kooloo, ...	35,000	3,500,000
Mundee, &c., ...	40,000	4,000,000
Protected Hill States,	10,000	1,000,000
Jousar Bawer, ...	10,000	1,000,000
Derah Dhoon, ...	100,000	10,000,000
Western Gurhwal, ...	180,000	18,000,000
Kumaon, ...	3,500,000	350,000,000
	lbs.	930,000,000

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A quantity equal to the whole export trade of China; and with high cultivation, the figures might easily be doubled, and thus not only allow an immense quantity for the consumption of the Indian community, but at the same time afford a vast supply for export to other countries.

29. In February last, at the request of the Lieutenant-Governor of the Punjab, I proceeded to the Kohistan of the Rawul Pindee District and Huzara, there to establish the tea plant, which has been most successfully done, the plants removed from the Kangra plantations and transplanted at Seelah now growing with vigour.

30. We have now thus the tea plant thriving over 4° 30′ of latitude and 8° of longitude, or from the Kalee river in the east to Huzara in the west, and from Dehra Dhoon in the south to Ramaserai in West Gurhwal in the north, or over a tract containing upwards of 35,000 square miles. In this mighty tract, the whole of which might have been the property of Government, had it not alienated away its just rights to others, from a mistaken idea that its retention would be unproductive and unprofitable, there is a sufficient quantity of land fitted for tea cultivation, which, if so used would produce teas capable of supplying the whole world.

31. The crops generally grown in the Hills yield but a small return to the cultivators, and thus they are obliged to look to other sources than the sale of the produce of their lands to procure means to pay their revenue. The Kumaon and Gurhwal Provinces, covering a tract of upwards of 19,000 square miles, yield little more than two lakhs of rupees annually to the State, showing the poverty of the country. Tea, on the other hand, is a highly remunerative crop, and occupies the time and attention of millions of beings in the adjoining kingdom of China, and is the means of yielding a large revenue to the State. India possesses

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within itself capabilities equally advantageous for the cultivation, in having abundance of land fitted for the purpose, unlimited and cheap labour, and great rivers ; ere long, an iron road for transmitting the produce to good and available markets; and last, not least, a climate equally well adapted for the growth of the plant, as has been proved by the Government plantations scattered over the country.

32. By the press it has been stated that the land fitted for tea cultivation was limited, and labour scanty. But both are great errors. Land in the vast forest tracts admirably fitted for the tea plant abounds, and when brought under cultivation with tea, which is gradually being done, and which the fine plantations at Ayar Toli, Paoree, &c., have proved to be so well adapted for the purpose, tea on them could be raised to a vast amount, and form a mighty export trade. In many districts, too, in the hills, admirably fitted for tea, now covered with dense and impenetrable forests, as in Kutyoor and Gungolee, there are no roads, or roads wholly unfitted for beasts of burden ; nor can good roads be expected, until the country yields a produce sufficiently valuable to pay the expenses of opening it up, and at the same time offers to Government some return for the labour and money which would require to be spent. Were tea, therefore, generally introduced, a produce would be forthcoming which would yield the requisite means to open up those hitherto neglected mountainous regions.

33. In six or eight years, the Dehra Dhoon, particularly the western portion, will present one sheet of tea cultivation. There we have the following parties actively and energetically carrying on the work :—Close to the Jumna, we find the luxuriant plantations of Messrs. Rind and Co., Messrs. M'Pherson and Co., and the Western Hopetown Tea Company. Here, too, there are some fine planta-

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tions cultivated by natives, as Heera Lall, &c. Further to the eastward, we come to the fine tea plantations of the Dehra Dhoon Tea Company (with a capital of twenty lakhs of rupees), by whom tea is now being manufactured in large quantities; the fine plantations of Messrs. Dick, Messrs. Barlow and Co., Messrs. Forrest and Co., Messrs. Batt, Messrs. Swetenham, Messrs. Richards, &c.

34. By wealthy and intelligent natives many fine plantations have also here been formed, the most important being those of Lalla Ram Nath and Nund Lall, at Hurbunswallah; Dhoom Singh, at Gurree; Kunayah Lall and Thakoor Dass, at Nurungunpore; Rajah Lall Singh, at Nuthunpore; and Mahunt Preet Ram Dass, at Umbewallah.

35. In the centre of the valley at Kowlaghir is the great Government plantation, from which has sprung all the plantations around.

36. The move, therefore, is now a gigantic one, and in the following table (C.) I have attempted to show approximately the quantity of land being brought under cultivation, and the men and capital thus employed. But it is a mere approximation, as, monthly, new parties are entering on this now highly popular field of enterprise.

37. To the westward (or Kohistan) of the Punjab and Kangra valley, &c., an enormous amount of capital is also being invested in the undertaking, and the valleys and hill sides are rapidly being covered with tea plants; and that, too, in a country where ten years ago the tea plant was unknown.

38. The work there done will form the subject of a report of the Punjab Government.

39. But it is no longer an experiment, tea cultivation in the North-Western Provinces having passed from

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experiment to fact—it having been proved by data which cannot be gainsayed, that the cultivation of the tea can be profitably conducted; that the tea prepared is admirably fitted for the Home and Indian markets; and that, if properly conducted and backed by capital, the undertaking presents a safe and profitable investment.

40. This having been fully proved, and the field occupied by an immense amount of capital, the time, in my humble opinion, has come for Government to retire from the field, and allow it to be occupied unfettered by the private capitalist.

41. Already many estates, raised entirely from plants and seeds supplied gratis from the Government plantations, have changed hands for large sums of money, as the Hurbunswallah Estate in the Dehra Dhoon, for £50,000, and several others, also raised from seeds and plants distributed gratis from the Government plantations.

42. By many private planters, seeds and seedlings are now offered in any quantity and number for sale. This, therefore, shows that the field is fairly occupied, and that aid from Government is no longer required to induce parties to go on with the cultivation.

43. The move is already a national one, and the part which was necessary for a great, liberal, and powerful Government to play is completed.

44. Parties with limited capital of a few thousand rupees are now rushing into the field to take up waste land, and form plantations from the seeds and plants given gratis from the Government plantations. Such individuals are rushing on their ruin, and must break down; or they must sell the plantations thus formed, unless supported by capital. To form a plantation is an easy affair; but to work that plantation, prepare and pack teas fitted for the market, and to

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forward such teas to distant and available markets, is not to be done without money; and tea cultivation, to be highly remunerative, must be conducted on a large scale. The local markets open at present for the produce of the factories now in operation will soon be glutted, and thus cause the growers to seek markets for their produce in those of Europe, America, or Australia. But these markets cannot be reached without capital. For parties, therefore, with only a few thousands of rupees to attempt to embark successfully in tea speculation, is, in my humble opinion, a mistake; and to these men the gratis distribution of seeds and plants, and the easy terms on which waste lands can be obtained in the Kohistan, are the primary inducements. But, as stated above, Government have fully played out their part, and the support so generously tendered for many years to private parties is now no longer required.

45. For Government now to part with their tea plantations, the time, therefore, has come. I would, therefore, respectfully venture to suggest that at the end of the present season the tea plantations in Kumaon and the Dehra Dhoon be sold in fee-simple to highest bidder, that the sale be advertised in the Indian and Home papers, and that in March, 1864, the highest tender above the upset price be accepted. This would give ample time to advertise the sale in the Indian and Home papers, and at the same time, the produce of this season will then be all finished, sifted, and packed, and thus ready for removal.

46. I would further recommend that the plantations be sold in three lots :—

1st,—That the plantations at Hawal Bâgh at or near Almorah, and at Ayar Toli, in Kutyoor, with their dwelling-houses, factories, stock and block, and everything complete for preparing and packing teas, be offered for sale at an upset price of two lakhs of rupees.

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2nd,—That the plantations at Bhim Tal in Kumaon, with its factory, stock and block, and everything complete for preparing and packing tea, be offered for sale at an upset price of Rs. 20,000.

3rd,—That the plantations at Kowlagir in the Dehra-Dhoon, with the factory, &c., stock and block, and everything complete for preparing and packing teas, be offered for sale in fee-simple at an upset price of two lakhs, (£20,000).

47. In the Home markets, teas the produce of the Government factories in the North-West Provinces and Punjab are well-known, but seldom seen. The sample about to be transmitted, consisting of three hundred 40lbs. chests, will show to London capitalists the kinds of tea capable of being produced, and will thus assist, along with advertisements, to attract attention to the plantations which are shortly to be thrown into the market. A detailed list, showing the kinds of teas packed and forwarded to Her Majesty's Secretary of State for India, will shortly be transmitted for information.

I have, &c.,

W. JAMESON, *Surgeon-Major*,

Superintendent Botanical Gardens,

North-Western Provinces

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WOOD.

No. 1.

SEASONING OF WOOD.

REPORT *to* H. B. RIDDELL, ESQ., C. S., POST-MASTER-GENERAL, N. W. P., *on the* ARTIFICIAL SEASONING OF BABOOL WOOD *for Carriage Wheels, &c., by* G. PATON, ESQ., POST-MASTER, ALLYGURH, *dated 22nd October*, 1849.

SIR,—I HAVE the honour to report to you the result of my experience in seasoning babool wood by boiling it in water. I am aware that the process of boiling is not new as a mode of seasoning wood, but I believe it has been generally supposed that it is attended with a diminution of strength, elasticity, and durability, and as I have not found such to be the case, I am of opinion that a knowledge of the fact is of some consequence, When requested to undertake the superintendence of the Mail-cart Establishment on the Grand Trunk Road in 1842, I found great difficulty in procuring seasoned wood for wheels. Sissoo wood was very high in price, and so scarce that I could not procure it in sufficient quantity. I was therefore obliged to have recourse to babool wood, and although plentiful, it was difficult to command a supply of any that had been seasoned by the common process of drying. This led me to have some fresh wood boiled and dried, and I was not a little surprised to find that the wheels made of the wood by the usual process of seasoning by drying were worn out, while those that were made of the wood seasoned by boiling were in an excellent state of preservation, although both had been subjected to the same or an equal degree of tear and wear. The experiment appeared at once conclusive, that boiling did not, as generally supposed, impair the strength, elasticity, and durability, at least of this species of wood; but on the contrary preserved and increased those qualities. Subsequent experience has tended to

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confirm this opinion, and I am inclined to account for the fact by the circumstance of *tannin* existing in and abounding in the bark of this wood. By boiling, the woody fibre is deprived of the fluid called the sap, while it is saturated or impregnated with the *tannin*.

The cohesion and solidity, or density of the wood, are increased, and the susceptibility to warp, split, swell, or contract, by the alternating exposure to heat and cold, dryness and moisture, is diminished by this mode of seasoning, and I attribute all these advantages over the common process, of simply drying, to the amalgamation of the *tannin* with the woody fibre.

We have a well-known instance of the action of *tannin* on the prepared skins of animals, which renders them, by uniting with gelatines, strong, tough, and durable, or converts them into leather. Green wood answers best for boiling, evidently on account of the greater facility with which it parts with its sap or juices, and becomes impregnable with *tannin*. The bark should be more or less fresh, and boiled along with the wood. The length of time in boiling the wood should never exceed twelve hours, otherwise the strength, in place of being increased, might be impaired. After boiling, care should be taken to place the wood for some days under cover, and free from the chance of a current of air. The rainy and cold seasons are most favourable, and advantage should be taken of them.

The average time required for thorough seasoning by boiling is only four months, whereas, by the slow process of seasoning by the natural action of the atmosphere, it is never less than from two to five years.

Independent, then, of the advantages already enumerated, we have also the important one of economy, to recommend the seasoning by boiling. To carry on the Mail

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Carriage, Truck, and Wagon Establishment now attached to this office, a large amount of capital would have to be expended, for the purpose of having in hand at all times a large supply of dry timber. This speedy process of seasoning is the means of saving the interest of the capital that otherwise would have to be employed. So much do I value *tannin* as a preservative of timber by boiling, that I would venture to throw out a suggestion of an experiment being made with it in our dockyards, where dry-rot has of late been so destructive in our wooden walls. The oak, like the babool, has its bark abounding with *tannin*; and if boiled together, the result might be equally important, in speedily seasoning without impairing the strength, and also of preserving it from the dry-rot. I have observed that the sap-wood, or alburnum of the babool, is by boiling rendered as good as the best wood, and the preservation of it I attribute to the *tannin*. The sap-wood, if left to the natural action of the atmosphere, would be found useless, as it would speedily become soft or friable, as if consumed by a species of insect or dry-rot. The exact nature of dry-rot is, I believe, still an open question, on which there is much diversity of opinion, but whether from the action of the seeds of cryptogamous plants vegetating in timber, the fermentation of the juices or albuminous parts, or from the consumption of the woody fibre by insects, I feel warranted in recommending the process of seasoning by boiling with *tannin* as a preservation of timber, from the simple observations of its effect in the sap-wood of the babool tree. In what I have stated, my experience is entirely confirmed to the use of the babool wood for wheels, for the composition of all the parts of which, *viz.*, the nave, spokes, and fellies, it is equally well adapted. Those pieces are cut out in the rough state, then boiled, and laid out to dry; when thoroughly dried, the rough surface is taken off, and then they are cut of the exact size and

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shape required. The pieces for naves, before being boiled, are carefully turned according to the size required; after boiling, small holes for the spokes are cut; and then they are placed under cover to dry. When nearly dry (which usually happens under three months) any cracks that appear on the surface are carefully filled with paste or putty. They are then painted, and placed in the open air or sun. A second coat of paint is usually applied while they are exposed in the open air, after which they are considered fit for use, and the holes may at any time be enlarged to the size required for the spokes. The proper seasoning of the nave is important, as on it the strength of a wheel chiefly depends.

As a proof of the durability of the wheels, I may mention that the palankeen carriages and trucks, running at the average of 7 or 8 miles in the hour, have passed over the distance of 114,660 miles; while the wagons, travelling at the rate of two miles in the hour, have passed over 50,652 miles.

The former have been in use about five, and the latter about three years and a half, with exposure at all times to the climate; and notwithstanding, the wheels are still quite serviceable. The wheels of the mail-carts, which run upwards of ten miles in the hour, have worn equally well; but I am unable to ascertain exactly the distance over which they have passed. I give a decided preference to the straight or cylindrical wheel, as I am convinced that it is stronger and more durable than the wheel with much dishing. I think the result of the tear and wear of the wheel made here will bear a comparison with the wheels made of the best seasoned materials in any part of India or England.

I have, &c.,
G. PATON,
Post-master.

ALLYGURH POST-OFFICE:
The 22nd October, 1849.

No. 2.

REPORT ON THE DIFFERENT KINDS OF WOOD PROCURABLE ON THE LINES OF THE AGRA AND BOMBAY ROAD, AND THE GREAT DECCAN ROAD.

Extract, Paragraphs 1 to 3 of a Letter from the SUPERINTENDING ENGINEER *of the Central Provinces to the* OFFICIATING SECRETARY *to the* MILITARY BOARD, *Fort William, No. 352, dated the 14th June, 1851.*

1. I have the honour to inform you that I have on the 21st ultimo forwarded, for the purpose of being despatched by steamer from Allahabad, a box containing specimens of wood of such kinds in the neighbourhood of the Agra and Bombay Road as may be deemed fit to be subjected to scrutiny, chemically and otherwise, comparatively with sâl and teak, with a view of testing their merits for employment in the construction of lattice bridges. A tabular statement accompanies this letter, detailing the nature and description of the wood, where found, and the uses to which they are put by the natives, with such other information as may be deemed necessary to enable a judgment to be passed on their merits.

2. This communication has reference to the 45th paragraph of my Report on that road, No. 2078, dated the 24th February, 1851; and as there are several localities which I have detailed in that report where these bridges might be advantageously employed, the subject is worthy of consideration.

3. The *muhwa* and *khowra*, but especially the former, are abundant, and used for such purposes as show their adaptability to these kinds of bridges; and I have little doubt, but that if seasoned properly and saturated with the chloride of zinc or sulphate of copper, would be found a valuable material for the purposes I allude to.

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Statement of Timbers procurable on the Agra and Bombay Road, Great Deccan Road, Gwalior and Cawnpore Divisions of Public Works.

Name of Wood.	Where found.	Division.	Nature and Properties.	Remarks.
Khowra, ...	(No. V.) Dark colour, between Seepree and Indore.	Gwalior.	Close-grained, hard, tough, not liable to bend.	The khowra is used extensively for beams, planks, and fellies of wheels, between Ragoogurh and Puchore. Timbers of 20 feet can be obtained only after enquiry, but smaller timbers of 12 and 15 feet can be procured easily. Planks for bridge building, 12 feet in length, by 12 inches in breadth and 3 inches in thickness, will cost, on an average, one rupee each, including all expenses.
Sadhir, ...	(No. VIII.) Around Sarungpore, Augur, and Indore.	Ditto.	More flexible than muhwa or khowra, and a lighter wood.	This is almost the only wood used for beams around Sarungpore, Augur, and Indore, but as it is a lighter wood as well as cheaper than the muhwa or khowra, additional stiffness should be obtained at the same expense by increase of scantling.
Muhwa, ...	(No. II.) Seepree and Indore.	Ditto.	It is hard, durable, tough, strong, and cheap. When freshly cut, it bends very much; but a well-seasoned timber is almost inflexible.	It is difficult to obtain muhwa timbers of any great length, and when obtained, the timbers are always of small scantling. But 3-inch planks, 12 feet long by 10 inches in breadth, more or less, can be procured at an average price of one rupee each,—felling, squaring, and carriage included. For bridge purposes, I consider the old red muhwa is the best timber procurable along the Bombay road, from Seepree to Indore.

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Statement of Timbers procurable on the Agra and Bombay Road, Great Deccan Road, Gwalior and Cawnpore Divisions of Public Works.—(Continued.)

Name of Wood.	Where found.	Division.	Nature and Properties.	Remarks.
Muhwa, ...	In the Budowrah, Sirsee Mhow, and other forests.	Agra and Bombay road.	It is of a tough and durable nature.	This wood is plentiful. Seasoning in water is advisable. Roof timbers or *kurrees* of this wood have lasted 100 and 150 years. Scantlings varying in diameter from 9″ to 3′ and 4′, and may be purchased from 1 to 6 rupees per tree. The fruit of this tree gives a fair annual return to the zemindars; consequently objections may be made to fell trees: length from 15 to 20 feet.
Ditto, ...	Is found all over the southern portion of Bundelkund.	7th or Cawnpore Division.	Is reckoned the next best wood to sâl wood.	Is found in greater or less quantities all over the southern portion of Bundelkund. Average length from 16′ to 18′ and from 14″ to 18″ in thickness. May sometimes be procured of a larger size than this; and is a good serviceable timber, if properly seasoned, by being left for a couple of months in a running stream. Muhwa timber is used for *chowkuts* of doors, plank doors, wall plates, and principals, &c., in roofing, and for the latter purpose is reckoned the next best wood to sâl wood. It would, I think, answer very well for the large beams in bridges if it could be preserved from *ghoon*.
Khyre, ...	(No.) Plentiful on the hills, and in ravines.	Agra and Bombay road.	Hard and brittle.	This wood is plentiful on the hills, and in the ravines in most of the forests; and seasoning by placing in a dung-hill is recommended. It answers well for uprights, and receives a good polish. Lengths from 12′ to 14′, diameter 8″ to 15″. Frames for hackeries, ploughs, and pivots for sugar-mills, are made of this wood, and it may be felled in the forests without purchase-money.

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Babool, ...	(No. I.) Between Sasram and Gonah, and for miles east and west.	Agra and Bombay road.	It may be classed as the best sort of wood for tre-nails. If well seasoned in water, it will neither rot nor *ghoon*.	This description of wood is well known, and is generally procurable at most villages between Sasram and Gonah, and for miles east and west; varying in diameter from 3″ to 1½′ and 2′, and may be purchased at 6 annas to 3 and 3½ rupees.
Teak, ...	Between Jubbulpore and Nagpore.	Great Deccan road.	This is too well known to need description.	At present much teak of a large scantling cannot be obtained very near the line of road, for the demand for it was so great, and the natives so reckless in the destruction of undersized trees, that in a few years the forests here were likely to be denuded of teak. Fortunately, the Deputy Commissioner reported the circumstance to Government, and in 1847 received orders to prevent the indiscriminate cutting of teak. The young trees abound, and look very flourishing, and this forest promises in a few years to become a very valuable one.
Tendoo, ...	In the jungles at Mungowah; also in the jungles bordering on the Nagpore road	Great Deccan road.	It has a slight degree of elasticity; should be kept well exposed: if buried, will soon be attacked by worms, &c.	It is used for palkee poles, axle-trees, &c., and the ebony makes good wheel-boxes, and the numerous fancy articles to which it is applied. It weighs per cubic foot 70 lbs.
Ditto, ...	Plentiful in the forests.	Agra and Bombay road.	If well seasoned in water, and felled at the close of the rains, is durable and tough.	Frame pieces and wooden axles for hackeries are made of this wood, varying in diameter from 6′ to 2′. Readily attacked by *ghoon*, but never rots. Length from 15′ to 18′ and may be felled in the forests without purchasing.
Ditto, ...	In the neighbourhood of Adjegurh and Bisramghât.	7th or Cawnpore Division.	It resists the effects of water, and does not warp in the sun, nor rot.	Grows in considerable quantities. Average length 10′ to 12′ 4′ inches in diameter below, and 3′ above; is a good serviceable timber when left to season for 3 or 4 years: should be cut after the rainy season; and is well adapted for parts of wooden bridges. It is procurable in shape of bullies or beams. It is mostly employed by natives in the construction of hackeries, and other articles requiring a durable kind of timber.

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Statement of Timbers procurable on the Agra and Bombay Road, Great Deccan Road, Gwalior and Cawnpore Divisions of Public Works.—(Continued.)

Name of Wood.	Where found.	Division.	Nature and Properties.	Remarks.
Koah, ...	In Budowrah and Sirsee Mhow forests.	Agra and Bombay road.	If well seasoned in water is elastic and tough.	Hackeries and frames are made of this wood, varying in diameter from 1′ to 1½′. Sometimes rots and *ghoons.* It may be procured in length from 18′ to 25′, and may be felled in the forests without purchasing. The only expense would be felling, scantling, and carting.
Beejah Sâl, ...	In the neighbourhood of Mungowah; also in the jungles bordering on the Nagpore road.	Great Deccan road.	Liable to split, but is very durable, and the least moisture will cause it to throw out stains.	It is much used in house-building, particularly where large beams are required, for it combines great lightness with great strength. Now that teak is difficult to be obtained in these jungles, beejah sâl in a great measure supplies its place. It weighs per cubic foot 66lbs.
Saj, ...	Ditto, ditto.	Ditto ditto.	It is heavy, sinks in water, close-grained, and durable.	Grows to a height very straight, and timbers of 50 feet in length and 12 inches square are obtainable. Much used in house-building and constructing carts. A cubic foot weighs 75lbs.
Sessu, ...	Ditto, ditto.	Ditto ditto.	Is a handsome, close-grained, black, strong, and durable wood.	Grows to a considerable size, and is obtainable in timbers 18 feet in length, with a scantling of 18″. Out of twelve trees eleven of them will be of no great use to the cabinet-maker, for the heart of the tree is generally cracked, and filled with a kind of petrified resin. The natives use it for toothed combs, also for fellies of wheels, writing-desks, &c. Weighs per cubic foot 78lbs.

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Dhangairi, ...	In the neighbourhood of Mungowah; also in the jungles bordering on the Nagpore road.	Great Deccan road.	Is a close-grained and very strong wood.	Timbers of 16 feet in length, and 12 inches scantling, are obtained with difficulty. I think it rather liable to split. Weighs 69lbs. per cubic foot.
Pursudh, ...	On the Sohagee hills.	Ditto ditto.	Is a dark, very heavy, durable, close-grained, and hard wood.	It is used for door-frames and trusses; timbers of about 12 feet in length and 9 inches square may be obtained from the trunk of the tree. A cubic foot of this wood, when dry, weighs 102 lbs.

H. GOODWYN, Lieut.-Col.,

Superintending Engineer, C. P.

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No. 3.

EXPERIMENTS ON STRENGTH OF SAL TIMBER.

MEMORANDUM *of Experiments on the Strength of Sâl Timber to the results of which the practical rules of* TREDGOLD, BARLOW, *aud other standard authors are applied;* by* C: B. THORNHILL, ESQ., *Secretary to the Shahjehanpore Road and Ferry Fund Committee.*

1. In all works of construction in which timber is employed, it is a point of great importance to regulate its dimensions, so as to obtain the requisite strength without superfluous expenditure of valuable material.

2. The knowledge necessary to determine these dimensions in any given case, must be derived from a consideration of the general laws which regulate the resistance of timber to pressure.

3. But since every variety of wood possesses distinct qualities affecting its capability of withstanding strains applied in different directions, it is necessary by frequent and careful experiments to ascertain what are the peculiarities of each variety; and the results furnish a simple rule for the solution of the problem in the first paragraph.

4. Having had my attention directed to the employment of sâl timber in the construction of bridges, I obtained the results of some previous experiments, but found that the strength of sâl timber deduced from them varied from 523, which is less than the strength of common fir, up to 779, which is greater than that of common oak.

5. This discrepancy seemed to render further experiments desirable; and the subjoined series was consequently undertaken. Being fully aware that the value of such experiments consists only in their accuracy, and that when

* Intended for the assistance of Local Committees who have not the aid of professional engineers in their works of construction. The experiments were reported in July, 1846.

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carelessly conducted they are worse than useless, every endeavour was made to avoid inaccuracy. Each point was observed and noted down by myself on the spot, and no new step in any experiment was made, until the previous one had been recorded.

6. In investigating the resistance offered by rectangular beams to a load suspended from their centre, the ends being supported, it has been found "that the strength is directly as the breadth and square of the depth, and inversely as the length."—(*Tredgold.*)

7. To apply this rule practically, we must ascertain the exact weight by which fracture is produced, in bars of wood of given dimensions.

8. The weight thus ascertained by experiment, reduced to pounds avoirdupois, is multiplied by the length of the distance between the points of which the bar was supported, in feet. The product is divided by the breadth of the bar in inches, multiplied by the square of the depth also in inches; and the quotient represents the value of the wood, in its capability of resisting cross strains.

9. This value is usually designated by the letter C.; and the formula for obtaining it is this; $\frac{W \times L}{B \times D^2} = C$; where W. is the weight producing fracture in pounds avoirdupois; L. the distance between the points of support, in feet; B. the breadth in inches; and D. the depth of the wood in inches.

10. The value of C., being deduced from the average of numerous experiments, is assumed to represent the true value of the wood employed; and the solution of the problem stated in the first paragraph is found in the following simple equation:

$$\frac{B \times D^2 \times C}{L} = \text{weight which is just sufficient to produce fracture.}$$

11. The subject of the following experiments is to arrive at this value of C. in sál timber,—the growth of the forests in the Pillibheet, Shahjehanpore, and Oudh Terais.

12. The mode of conducting them was as follows. Strong squared posts were let into the ground at intervals of 14 inches, 3 feet, 5 feet 1 inch, and 8 feet, and carefully secured. The bar to be experimented upon was placed upon the heads of the posts, so as to rest firmly in a horizontal position. A scale of known weight was then carefully suspended from the centre of the bar, and the weights placed in the scale; an interval of about two minutes being allowed between the addition of each successive weight to note the deflection, which was measured from a thread kept in a state of tension between the upper edges of the ends of the bar.

13. The weights used were standard maunds and seers, which were subsequently reduced to pounds avoirdupois.

14. Before proceeding to examine the results of the experiments, there is another point which demands attention. A beam may be loaded to such an extent, that its deflection, without endangering the security of the timber, may have a most unsightly appearance. It is therefore necessary to have some rule for calculating the dimensions of timbers, so as to guard against excessive deflection.

15. Tredgold, Young, Jackson, and other authorities, state that $\frac{L^3 \times W}{B \times D^3}$ is as the deflection d; and hence deduce a practical rule for ascertaining a constant value for the deflection of the same material, $\frac{L^3 \times W}{40 \times B \times D^3 \times d} = a.$ The value of a in the experiments has been calculated by this formula from 77 observations.

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Detail of Experiments on the Strength of Sâl Timber.

Number of Experiment.	Weight in Pounds Avoirdupois.	Weight in Company's Maunds.	Weight in Company's Seers.	Weight in Company's Chittacks.	Deflection in Inches.	Remarks.	Value of *a*.
1						Bar of sâl, free from apparent flaws, 1″ square. Distance between points of support=3.	
	89·48	1	3	8	·8		·0132
	130·63	1	23	8	1·15		·0170
	161·48	1	38	8	1·4		·0128
	171·77	2	3	8	1·6	On removing the weights, the bar was found to have a permanent deflection of 18″. Upon suspending 233·48 lbs. it snapped suddenly.	·0138
	233·48	2	33	8		Value of *C.*=700·44.	
2	171·77	2	3	8	1·4	Bar as in No. 1.	·0120
	192·34	2	13	8	1·7		·0130
	202·63	2	18	8	1·85		·0135
	208·8	2	21	8	2·05		·0145
	222·55	2	28	3	2·30		·0153
	243·77	2	38	8		Sounds of fracture were emitted.	
	246·85	3	0	0		Broke. Value of *C.*=740·55.	
3	213	2	23	8		Broke. Wood same as above, but found defective internally.	
4	171·77	2	3	8	1·3	Bar as in previous experiments.	·0112
	213	2	23	8	1·8		·0126
	233·48	2	33	8	2·2		·0139
	243·77	2	38	8	2·4		·0146
	254	3	3	8	3	Sounds of fracture, followed by gradual disruption. Value of *C.*=762.	
5	475	5	30	14	1·15	Timber, *best* sâl; 2″ square, 5-1″ between supports.	·0118
	557·23	6	30	14	1·25		·0109
	711·51	8	25	14	1·5		·0136
	793·8	9	25	14	1·75		·0107
	876	10	25	14	1·95	Sounds of fracture emitted. After a short interval the bar broke. Value of *C.*=556·26	
6	344·31	4	7	6	·45	Bar as in previous experiments.	·0064
	475	5	30	14	·95		·0097
	721·8	8	30	14	1·5		·0101
	804	9	30	14	1·7	Sound of fracture; value of *a* consequently not calculated.	
	845.23	10	10	14	1·95		
	865·8	10	20	14	2·3		
	876	10	25	14	2·4		
	889·45	10	32	6	2·4	After this weight had been sustained a short time, the bar broke slowly. Value of *C.*=564·8	

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Detail of Experiments on the Strength of Sâl Timber.—(Contd.)

Number of Experiment.	Weight in Pounds Avoirdupois.	Weight in Company's Maunds.	Seers.	Chittacks.	Deflection in Inches.	Remarks.	Value of *a*.
7	475	5	30	14	1·35	Bar as before.	
	571·63	6	37	14	1·4		·0140
	695	8	17	14	1·7		·0119
	777·28	9	17	14	1·9		·0119
	859·56	10	17	14	2·2		·0119
	900·7	10	37	14	2·6	Sounds of fracture.	·0125
	921·27	11	7	14	2·8		
	931·55	11	12	14	3·05		
	941·83	11	17	14	3·5	Broke.	
						Value of *C.*=598·062	
8	672·68	8	7	0	1	Bar of *ordinary* sâl=3″ square, 8′ between the points of support.	·0082
	950·91	11	22	4	1·5		·0100
	1146·6	13	37	6	1·85		·0102
	1277·22	15	20	14	2·1		·0104
	1359·5	16	20	14	2·2		·0102
	1441·78	17	20	14	2·4		·0105
	1482·92	18	0	14	2·5		·0106
	1524	18	20	14	2·6		·0108
	1565·2	19	0	14	2·7		·0109
	1606·34	19	20	14	2·8		·0110
	1647·48	20	0	14	2·9		·0111
	1688·62	20	20	14	3·05		·0114
	1729·76	21	0	14	3·1		.0114
	1770·9	21	20	14	3·3		·0117
	1812	22	0	14	3·4		.0118
	1853·18	22	20	14	3·5		·0119
	1894·32	23	0	14	3·6		·0120
	1935·46	23	20	14	3·7	From this point the deflection became very rapid.	·0121
	1976·6	24	0	14	4·1		·0131
	2017·74	24	20	14	4·3		·0135
	2058·88	25	0	14	4·6		·0141
	2100	25	20	14	4·8	Sounds of fracture.	
	2141·22	26	0	14		Broke.	
						Value of *C.*=634·43	
9	1051·45	12	31	2	1·95	Bar as in previous experiment.	·0130
	1261	15	13	0	2·35		·0118
	1426·58	17	13	0	2·5		·0110
	1593·14	19	13	0	2·8		·0111
	1759·7	21	13	0	3·25		·0116
	1926·26	23	13	0	3·8		.0124
	2008·54	24	13	0	4·2	Cracked.	
	2049·68	24	33	0	4·5	Broke after a short interval.	
						Value of *C.*=607·31	

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Detail of Experiments on the Strength of Sál Timber.—(Contd.)

Number of Experiment.	Weight in Pounds Avoirdupois.	Weight in Company's Maunds.	Seers.	Chittacks.	Deflection in Inches.	Remarks.	Value of a.
						Bar as in previous experiment.	·0124
10	1840·11	22	14	8	3·6	Broke directly. A large weight was	
	1970·74	23	38	0		loaded suddenly upon this bar. Value of $C.$=583·9	
11	220·61	2	27	4	0·7	Bar 1·5″ deep, 1″ broad, 3 feet between supports.	·0106
	337·35	4	14	0	1·0		·0160
	416·28	5	2	6	1·4		·0148
	457·42	5	22	6	1·6		·0141
	500·62	6	3	6	1·9		·0175
	547	6	25	14	2·3	Deflection increased rapidly after a few seconds, and bar broke. Value of $C.$=729·3	·0190
12	382·34	4	25	14	1·4	Bar as above,=1·5″×1″×3′	·0183
	464·62	5	25	14	2·0	Broke suddenly. Value of $C.$=619·5	
13	382·34	4	25	14	1·1	Bar as above.	·0144
	464·62	5	25	14	1·8	Broke sharply. Value of $C.$=619·5	
14	382·34	4	25	14	1·4	Bar as above.	·0183
	464·62	5	25	14		Broke sharply.	
15	93·56	1	0	5	0·2	Bar as above.	·0107
	175·84	2	0	5	0·5		·0142
	216·9	2	25	0	0·7		·0161
	295·18	3	23	8	0·8		·0135
	449·2	5	18	6	1·2		·0133
	497·53	6	1	14	1·4		·0118
	538·67	6	21	14	1·6		·0149
	579·81	7	1	14	1·9		·0163
	600·38	7	11	14	2·2		·0183
	608·6	7	12	2		Broke very gradually. An excellent piece of wood. Value of $C.$=810·1	
16	382·34	4	25	14	1·8	Bar 2″ deep, 1′ broad, 5′ between supports.	·0126
	464·62	5	25	14	2·3		
	505·76	6	5	14	2·8	The bar slightly twisted with this weight, and broke with 505·76 lbs. Value of $C.$=632·2	
17	265·35	3	9	0	1·4	Bar as above.	·0138
	347·63	4	9	0	1·8	Snapped suddenly.	·0132
	430	5	9	0		Value of $C.$=537·5	
18	22				·5	Bar ·5″ deep, ·3″ broad, 1·16′, between supports.	·0219
	32				·8		·0240
	42					Broke. Value of $C.$=650	

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Detail of Experiments on the Strength of Sâl Timber.—(Contd.)

Number of Experiment.	Weight in Pounds Avoirdupois.	Weight in Company's Maunds.	Seers.	Chittacks.	Deflection in Inches.	Remarks.	Value of *a*.
19	42					Broke suddenly. Value of *C.*=650.	
20	38 47				·6 1·8	Broke gradually. Value of *C.*=726·9.	·0150
21	28 33 35				1·5 2	Same bars, flat, *i. e.* depth ·3″ breadth ·5″ length 1·16′ Broke. Value of *C.*=902·2.	
22	28					Same as above. Broke. Value of *C.*=721·8.	
23	42					Bar placed as in No. 18. Value of *C.*=650.	
24	84 91 98 112 126 140				·23 ·25 ·30 ·33 ·35	Bar=7″ deep, ·4″ wide, 1·16 apart. The bar slightly yielded laterally, and broke. Value of *C.*=828.	
25	112 136				·4	Bar as above. Broke. Value of *C.*=804·9.	
26	126 140				·5	Bar as above. Broke gradually. Value of *C.*=828.	
27	140					Bar as above. Broke gradually. Value of *C.*=828.	
28	84 112				·8 1·3	Bar 4″ deep, 7 wide, 1·16 between supports. Broke slowly. Value of *C.*=11·65.	
29	112					Bar as above. Broke suddenly. Value of *C.*=1165.	
30	91 105 112				·7 1·1	Bar as above. Broke gradually. Value of *C.*=1165.	

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Detail of Experiments on the Strength of Sâl Timber.—(Concld.)

Number of Experiment.	Weight in Pounds Avoirdupois.	Weight in Company's Maunds.	Seers.	Chittacks.	Deflection in Inches.	Remarks.	Value of a.
31	1169·74	14	8	10	4·4	Bar 3″ wide, 1·25″ deep, 3′ between supports. Value of C.=738·5	
32	879·14	10	27	6	2·5	Bar as above. Broke rather more rapidly. Value of C.=562·4	
33	893·31	10	34	4	1·8	Bar as above. Broke sharply. Value of C.=571·9	
34	893·31	10	34	4	1·8	Bar as above. Broke sharply. Value of C.=571·9	
35	1035	12	23	2	·2	Bar=2″ deep, 1·25″ wide, 3 feet between supports. Broke. Value of C.=621	
36	1046·31	12	28	10	1·5	Bar as above. Broke. Value of C.=627·8	
37	1006·45	12	9	4	1·2	Bar as above. Broke sharply. Value of C.=601·8	
38	787·37	9	22	12	·8	Bar as above. Snapped very suddenly. Value of C.=472·0	

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MEAN RESULTS.

The experiments, it will be seen, were tried with eleven different scantlings of wood; the average number tested being rather more than three of each.

No. of Set.	Mean of number of Experiment.	Distance in feet between supports.	Breadth of bar inches.	Depth of bar inches.	Value of *C.*	Value of *a.*
1	4 experiments, mean of 3; one excluded.	3	1	1	734·33	·0136
2	3 experiments, ...	5·083	2	2	543·82	·0113
3	3 ditto, ...	8	3	3	608·54	·0114
4	5 ditto, ...	3	1	1·5	679·58	·0152
5	2 ditto, ...	5	1	2	584·85	·0132
6	4 ditto, ...	1·16	·3	·5	669·2	·0203
7	2 ditto, ...	1·16	·5	·3	812	
8	4 ditto, ...	1·16	·4	·7	825·2	
9	3 ditto, ...	1·16	·7	·4	1165	
10	4 ditto, ...	3	·3	1·25	613·7	
11	4 ditto, ...	3	1·25	2	580·75	

Mean Result, $C.=710{\cdot}36$ $a=\cdot01417$.

This result, compared with the experiments of Barlow and Ebbels, places the sâl experimented on a little below teak, and on a par with oak of medium quality.

PRACTICAL APPLICATION, *adapted from Tredgold.*

To find the weight that would break a rectangular sâl beam, when applied at the middle of its length, the beam being supported at its ends.

RULE.—Multiply the breadth in inches by the square of the depth in inches; divide this product by the length between the points of support in feet; then the quotient, multiplied by 710·36, will give the weight in pounds.

That is $\frac{B\times D^2\times 710{\cdot}36}{L}$ = breaking weight.

Example.—Required the weight necessary to break a sâul timber 20′ between the points of support, 6″ broad,

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and 11 inches deep; supposing the weight to be placed upon the beam midway between the points of support.

Here, $\frac{9\times 11^2\times 710{\cdot}36}{20}=38{,}679$ lbs. More than 17 tons.

To find the scantling of a piece of timber capable of sustaining a given weight at its centre, the ends being sustained in a horizontal position.

Case I. When the *breadth* is given.

Rule.—Multiply the square of the length in feet by the weight to be supported in pounds, and this product by the value of $a={\cdot}01417$. Divide the product by the breadth in inches, and the cube root of the quotient will be the depth in inches; or

$$D=\sqrt[3]{\frac{L\times W\times {\cdot}01417}{B}}$$

Example.—A sâl timber, 24 feet long and 8 inches broad, is required to sustain on its centre a load of 5,000 lbs.; required the depth.

Here, $\sqrt[3]{\frac{576\times 5000\times {\cdot}01417}{8}}$ = about 17½ inches.

Case II. When the *depth* is given.

Rule.—Multiply the square of the length in feet by the weight in lbs., and this product by ·01417. Divide by the cube of the depth in inches and the quotient is the breadth.

$$B=\frac{L^2\times W\times {\cdot}01417}{D^3}$$

Example.—A timber, 24 feet long and 17½ deep, required to support from its centre a weight of 5,000 lbs.

$$\frac{576\times 5000\times {\cdot}01417}{(17\tfrac{1}{2})^3}=8 \text{ inches.}$$

In applying the foregoing rules, it must be remembered, that when the weight is diffused over the whole length of the beam, the timber is capable of sustaining twice the

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weight which would produce fracture, if suspended midway between the points of support.

Beams should always have greater depth than breadth, since the strength increases in the proportion of the depth.

To find the strongest form for a beam whose sectional area is given.

Rule.—Multiply the length in feet by the decimal ·06, and divide the given area in inches by the product. The square of the quotient will give the depth in inches.

The bearing of a beam is 20 feet; area of section given =48 inches.

Then, $\frac{48}{6 \times 20} = \frac{48}{12} = 4$ which squared=16″, the required depth; the breadth being 3″.

A beam, 16″ deep × 3″ wide, would bear more than twice as much as a beam 6·9″ square; although the area of section would be the same in both.

This shows how important it is to have a great depth in proportion to the breadth.

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END OF VOL. V.

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